

02-9004-37-SI

REV. NO. 0

FINAL DRAFT  
SITE INSPECTION REPORT  
ELIZABETH COAL GAS SITE #1  
ELIZABETH, NEW JERSEY

PREPARED UNDER

TECHNICAL DIRECTIVE DOCUMENT NO. 02-9004-37  
CONTRACT NO. 68-01-7346

FOR THE

ENVIRONMENTAL SERVICES DIVISION  
U.S. ENVIRONMENTAL PROTECTION AGENCY

JUNE 22, 1990

NUS CORPORATION  
SUPERFUND DIVISION

SUBMITTED BY:

  
DAVID GRUPP  
PROJECT MANAGER

  
RICHARD M. SETTINO  
SITE MANAGER

REVIEWED/APPROVED BY:

  
RONALD M. NAMAN  
FIT OFFICE MANAGER

203983



# SITE INSPECTION REPORT: LEVEL I

## PART I: SITE INFORMATION

1. Site Name/Alias Elizabeth Coal Gas Site #1  
Street 3rd Ave. Between South 2nd St. and Delaware St.  
City Elizabeth State New Jersey Zip 07200
2. County Union County Code 39 Cong. Dist. 7
3. EPA ID No. NJD981082894
4. Block No. 5 Lot No. 1381
5. Latitude 40° 38' 49" N Longitude 74° 11' 56" W  
USGS Quad. Elizabeth, New Jersey
6. Owner Elizabethtown Gas Light Co. Tel. No. (201) 289-5000  
Street One Elizabeth Plaza  
City Elizabeth State New Jersey Zip 08830
7. Operator Elizabethtown Gas Light Co. Tel. No. (201) 289-5000  
Street One Elizabeth Plaza  
City Elizabeth State New Jersey Zip 08830
8. Type of Ownership  
☒ Private ☐ Federal ☐ State  
☐ County ☐ Municipal ☐ Unknown ☐ Other \_\_\_\_\_
9. Owner/Operator Notification on File  
☐ RCRA 3001 Date \_\_\_\_\_ ☒ CERCLA 103c\* Date September 19, 1983  
☐ None ☐ Unknown

\*Note: A copy of an official CERCLA 103c form is not available. This information is based on the letter enclosed in Ref. No. 20.

10. Permit Information
- | Permit     | Permit No. | Date Issued | Expiration Date | Comments |
|------------|------------|-------------|-----------------|----------|
| <u>N/A</u> |            |             |                 |          |
11. Site Status  
☒ Active ☐ Inactive ☐ Unknown
12. Years of Operation 1857 to Present

12. Identify the types of waste units (e.g., landfill, surface impoundment, piles, stained soil, above- or below-ground tanks or containers, land treatment, etc.) on site. Initiate as many waste unit numbers as needed to identify all waste sources on site.

(a) Waste Management Areas

Waste Unit No.	Waste Unit Type	Facility Name for Unit
1	Unlined Pits	Waste Pits
2	Aboveground Containers	Concrete Bins
3	Aboveground Tanks	Oil Tanks
4	Aboveground Tank	Unused Oil Tank

(b) Other Areas of Concern

Identify any miscellaneous spills, dumping, etc. on site; describe the materials and identify their locations on site.

There is an expansion tank located on site that is reported to be used for water storage. The use of this water is unknown. A battery of aboveground propane storage tanks is located in the southwest corner of the property. A railroad spur exists on the northwest portion of the property. During an NUS Region 2 FIT off-site reconnaissance, a number of railroad tanker cars were seen parked on this spur. The contents or condition of these tanker cars is unknown.

13. Information available from

Contact Amy Brochu Agency U.S. EPA Tel. No. (201) 906-6802  
Preparer Richard Settino Agency NUS Corp. Region 2 FIT Date June 22, 1990

## **PART II: WASTE SOURCE INFORMATION**

Wastes produced on site were the result of gasification processes using coal, coke, and oil, as appropriate. These wastes typically include ammonia, ammonium sulfate, sulfur, coke, coal tar, coal tar pitch, clinker, and light oils. The coal tars may contain significant concentrations of pyrene, anthracene, and other polynuclear aromatic hydrocarbons (PAHs), including known or suspected carcinogens (Ref. No. 1, p. 4). Actual waste handling practices that occurred at the plant are largely unknown but areas of the yard were reported to be designated for waste storage. Concrete bins were used to separate and store tar, and oils were kept in aboveground tanks. Leaks or spills associated with these waste units are unknown. Wastes were also reported to be disposed of on site in several unlined pits. Poor grade tar and spent oil were most likely dumped on site. Evidence of this has reportedly been observed in the center of the property where the coal and coke piles were located (Ref. No. 1, p. 12). During an NUS Corp. Region 2 FIT off-site reconnaissance conducted on May 18, 1990, no evidence of waste or waste pits could be seen (Ref. No. 2). These pits have been reported to be underlain by relatively impermeable clay; test hole and test pit logs indicate the presence of wastes, including tar, clinker, coal, ash, and coke, underlain by layers of clay and silt (Ref. No. 6). No remedial action has been taken except for filtration of storm water runoff.

The manufacturing plant and most of the buildings were removed from the site in 1978 (Ref. No. 1, p. 12). The remaining potential hazardous substance sources in current use on site include two expandable gas holders, a liquified natural gas (LNG) storage tank, and an unused oil tank (Ref. Nos. 1, p. 12; 2). During the NUS Corp. Region 2 FIT off-site reconnaissance an earthen berm approximately 15 feet in height was noted around the LNG tank. Also, during the reconnaissance, a berm was noted around the unused oil tank (Ref. No. 2). An aerial photo of the area from 1940 shows this berm to have been in existence at that time (Ref. No. 3). The present condition of the oil tank and when its use was discontinued is unknown. The exact quantity of waste deposited on site, as well as the size or capacity of various smaller tanks and pits that currently exist or formerly existed on site, is unknown (Ref. Nos. 1, 2, 3).

## **PART III: PRE-EXISTENT ANALYTICAL DATA**

There are no known pre-existent analytical results available for the Elizabeth Coal Gas Site #1. During the NUS Corp. Region 2 FIT off-site reconnaissance, three monitoring wells were noted on site. There are no known data available for these monitoring wells.

## **PART IV: SITE INSPECTION SAMPLE RESULTS**

NUS Corporation Region 2 FIT did not conduct a sampling site inspection at the Elizabeth Coal Gas Site #1.



## **PART V: HAZARD ASSESSMENT**

### **GROUNDWATER ROUTE**

1. Describe the likelihood of a release of contaminant(s) to the groundwater as follows: observed, alleged, potential, or none. Identify the contaminant(s) detected or suspected, and provide a rationale for attributing the contaminant(s) to the facility.

It has been reported that poor quality tars and oils have been deposited in unlined pits on site in the past. Test hole and test pit logs confirm the presence of buried gasification wastes. These waste pits present a high potential for groundwater contamination since contaminants could leach through the soil to groundwater. The actual amount of waste deposited and the contaminants contained in the waste is unknown. Suspected contaminants include pyrene, anthracene, and other PAHs.

There is little potential for release to groundwater to occur from existing operations on site. The site is used for gas storage and distribution and is no longer used for manufacturing. There have been no reported releases from any of the existing tanks or gas holders.

Ref. Nos. 1, pp. 4, 12; 2; 6

2. Describe the aquifer of concern; include information such as depth, thickness, geologic composition, permeability, overlying strata, confining layers, interconnections, discontinuities, depth to water table, groundwater flow direction.

The aquifer of concern is the Passaic Formation, which was formerly known as the Brunswick Formation. The Passaic Formation is the most extensive and important aquifer in Union County. It is located from 15 to 30 feet below the ground surface in the vicinity of the site. The bedrock is composed of thin-bedded shales, mudstones, and sandstones which range in thickness from 6,000 to 8,000 feet. The permeability of shale is  $10^{-7}$  cm/sec. Overlying a majority of the Passaic Formation is a stratum of unconsolidated glacial sediments, consisting of clay, silt, sand, gravel, and boulders. The permeability of the glacial till and silty clay is  $10^{-5}$  to  $10^{-7}$  cm/sec. The thickness of these sediments generally ranges from 0 to 200 feet. Groundwater within the aquifer of concern occurs along joints and fracture zones which decrease in volume with depth. The permeability of fractured shale is  $10^{-3}$  to  $10^{-5}$ . Pump tests indicate joints and fractures which strike parallel to the strike of the bedding (southwest to northeast) are better developed and interconnected than those which strike in other directions. Groundwater in the area exists under confined and unconfined conditions resulting in both artesian and water table conditions, respectively. The confining layers consist of silt and clay beds. There is direct regional hydraulic connection between the glacial deposits and the bedrock, and also with adjacent surface water. The local groundwater flow is presumed to be southwest toward the Elizabeth River.

Ref. Nos. 4, 5, 6, 7

3. Is a designated sole source aquifer within 3 miles of the site?

A sole source aquifer has not been designated within 3 miles of the site.

Ref. No. 22

4. What is the depth from the lowest point of waste disposal/storage to the highest seasonal level of the saturated zone of the aquifer of concern?

On-site test pits and soil borings indicate that wastes associated with coal gasification exist at depths ranging from 1 to 8 feet. Groundwater has been observed in these soil borings and test pits to exist from 1 to greater than 15 feet beneath the site; therefore, wastes deposited on site are in contact with groundwater in the overlying strata of the Passaic Formation. The groundwater in these strata are hydraulically connected with the Passaic Formation.

Ref. No. 6

5. What is the permeability value of the least permeable continuous intervening stratum between the ground surface and the aquifer of concern?

The permeability value for overburden sediments consisting of glacial till and silty clay is estimated to be  $10^{-5}$  to  $10^{-7}$  cm/sec.

Ref. No. 7

6. What is the net precipitation for the area?

The net annual precipitation for the area is approximately 12 inches.

Ref. No. 7

7. Identify uses of groundwater within 3 miles of the site (i.e., private drinking source, municipal source, commercial, industrial, irrigation, unusable).

Groundwater within 3 miles of the site is used only for commercial and industrial purposes. There are no known wells used for drinking or irrigation purposes within 3 miles of the site. All wells that exist within 3 miles of the site are reported to be closed.

Ref. Nos. 8-12, 17, 21

8. What is the distance to and depth of the nearest well that is currently used for drinking or irrigation purposes?

There are no known wells currently used for drinking or irrigation purposes within 3 miles of the site. All wells that do exist within 3 miles of the site have been reported to be closed.

Ref. Nos. 8-12, 17, 21

9. Identify the population served by the aquifer of concern within a 3-mile radius of the site.

There are no people known to be served by the aquifer of concern within 3 miles of the site. All public supply water is supplied by the Elizabethtown Water Company and the City of Newark Water Department. These utilities receive water from reservoirs outside the 3-mile radius of the site.

Ref. Nos. 8-12, 17, 21

**SURFACE WATER ROUTE**

10. Describe the likelihood of a release of contaminant(s) to surface water as follows: observed, alleged, potential, or none. Identify the contaminant(s) detected or suspected, and provide a rationale for attributing the contaminants to the facility.

There is potential for a release of contaminants to surface water in runoff from the facility to have occurred as a result of past coal gas production. Coke and coal were stored in piles on site. Ammonia liquor, a waste product of coal gasification, was generally disposed of prior to 1950 by mixing with cooling water and discharging to the nearest waterway. It is also possible that oils and tar leaked or were spilled on to the ground surface and subsequently migrated to the Elizabeth River via surface runoff. It is reported that the U.S. Army Corps of Engineers built a 12 to 15 foot high embankment between the river and the site. It is unknown if this embankment prevents runoff migration from the site. Storm drains in the area do not discharge directly to surface water. Stormwater runoff is discharged to the sanitary sewer and subsequently treated. Presently, stormwater runoff is reported to be filtered before it leaves the site.

There have been no reported releases of contaminants to surface water. However, groundwater is presumed to flow to, and be in direct hydraulic connection with, the Elizabeth River. Wastes deposited on site are known to be in contact with groundwater underlying the site. Therefore, there is a potential for a release of contaminants to surface water through groundwater.

Ref. Nos. 1, pp. 4, 12, 19; 2; 6; 19

11. Identify and locate the nearest downslope surface water. If possible, include a description of possible surface drainage patterns from the site.

The Elizabeth River creates the southwest boundary of the site. This is the nearest downslope surface water. There is significant tidal influence on the river at this point. It is reported that the U.S. Army Corps of Engineers built a 12 to 15 foot high embankment between the river and the site. It is unknown if this embankment prevents runoff migration from the site. Storm drains in the area do not discharge directly to surface water and stormwater is reported to be filtered before it leaves the site. The Elizabeth River joins the Arthur Kill within 1 mile of the site.

Ref. Nos. 1, p. 13; 2; 13; 19

12. What is the facility slope in percent? (Facility slope is measured from the highest point of deposited hazardous waste to the most downhill point of the waste area or to where contamination is detected.)

The facility slope is less than 3 percent.

Ref. Nos. 2, 13

13. What is the slope of the intervening terrain in percent? (Intervening terrain slope is measured from the most downhill point of the waste area to the probable point of entry to surface water.)

The Elizabeth River borders the site to the southwest; therefore, the site is in contact with surface water.

Ref. Nos. 2, 13

14. What is the 1-year 24-hour rainfall?

The 1-year 24-hour rainfall for the region is approximately 2.75 inches.

Ref. No. 7

15. What is the distance to the nearest downslope surface water? Measure the distance along a course that runoff can be expected to follow.

The Elizabeth River, which is in contact with the site at its southwest boundary, is less than 1,000 feet from suspected waste source areas.

Ref. Nos. 2, 13

16. Identify uses of surface waters within 3 miles downstream of the site (i.e., drinking, irrigation, recreation, commercial, industrial, not used).

The Elizabeth River and the Arthur Kill are both classified as SE3 waterways in the vicinity of the site. Designated uses include secondary contact recreation, maintenance and migration of food populations, migration of diadromous fish, maintenance of wildlife, and any other reasonable uses.

Ref. No. 14

17. Describe any wetlands, greater than 5 acres in area, within 2 miles downstream of the site. Include whether it is a freshwater or coastal wetland.

A tidally influenced coastal wetland just over 5 acres in area is located approximately 0.25 mile downstream of the site. The wetland is classified as an emergent, intertidal, estuarine wetland.

Ref. Nos. 13, 15

18. Describe any critical habitats of federally listed endangered species within 2 miles of the site along the migration path.

There are no critical habitats of federally listed endangered species located within 2 miles of the site.

Ref. No. 16

19. What is the distance to the nearest sensitive environment along or contiguous to the migration path (if any exist within 2 miles)?

A 5-acre tidally influenced coastal wetland is located approximately 0.25 mile downstream of the site. This wetland is classified as an emergent, intertidal, estuarine wetland.

Ref. Nos. 13, 15

20. Identify the population served or acres of food crops irrigated by surface water intakes within 3 miles downstream of the site and the distance to the intake(s).

There are no known surface water intakes used for drinking or irrigation within 3 miles downstream of the site. All public supply water is supplied by the Elizabethtown Water Company and the City of Newark Water Department. Both of these use reservoirs located outside the 3-mile radius of the site.

Ref. Nos. 8-12, 17

21. What is the state water quality classification of the water body of concern?

The Elizabeth River and the Arthur Kill are both classified as SE3 waterways in the vicinity of the site.

Ref. No. 14

22. Describe any apparent biota contamination that is attributable to the site.

No apparent biota contamination was observed during the NUS Corp. Region 2 FIT off-site reconnaissance conducted on May 18, 1990.

Ref. No. 2

#### AIR ROUTE

23. Describe the likelihood of a release of contaminant(s) to the air as follows: observed, alleged, potential, none. Identify the contaminant(s) detected or suspected, and provide a rationale for attributing the contaminant(s) to the facility.

There is low potential for a release of contaminants to air. The site is presently used as a system dispatch center, and for storage and distribution of winter peaking supplies of liquified natural gas (LNG) and propane. It is no longer used for manufacturing. The unlined pits used for waste disposal in the past are reported to be buried on site. During the NUS Corp. Region 2 FIT off-site reconnaissance all tanks on site, with the exception of the unused oil tank, were observed to be well maintained. There have been no reported releases to air associated with the facility.

Ref. Nos. 1, 2

24. What is the population within a 4-mile radius of the site?

The population within a 4-mile radius of the site is approximately 272,000.

Ref. No. 18

#### FIRE AND EXPLOSION

25. Describe the potential for a fire or explosion to occur with respect to the hazardous substance(s) known or suspected to be present on site. Identify the hazardous substance(s) and the method of storage or containment associated with each.

The potential for a fire or explosion to occur with respect to hazardous substances suspected to be present at the facility is low. The unlined pits that were used for prior waste disposal are reported to be buried on site. During the NUS Corp. Region 2 FIT off-site reconnaissance all tanks on site, with the exception of the unused oil tank, were observed to be well maintained. There have been no fires or explosions known to have occurred at the site.

Ref. Nos. 1, 2

26. What is the population within a 2-mile radius of the hazardous substance(s) at the facility?

The population within a 2-mile radius of the site is approximately 74,200.

Ref. No. 18

**DIRECT CONTACT/ON-SITE EXPOSURE**

27. Describe the potential for direct contact with hazardous substance(s) stored in any of the waste units on site or deposited in on-site soils. Identify the hazardous substance(s) and the accessibility of the waste unit.

There is little potential for direct contact with the hazardous substances possibly deposited in on-site soils. The site is completely surrounded by an 8-foot barbed wire fence. There is a 24-hour guard on duty, and plant personnel monitor a closed circuit television scan of the plant entrance. Wastes deposited on site are reported to be buried in unlined pits and the yard is mostly covered by crushed stone and fill. During the NUS Corp. Region 2 FIT off-site reconnaissance no wastes associated with coal gasification were observed on site.

Ref. Nos. 1, 2

28. How many residents live on a property whose boundaries encompass any part of an area contaminated by the site?

There are no residential properties whose boundaries encompass any part of an area contaminated by the site.

Ref. Nos. 2, 13

29. What is the population within a 1-mile radius of the site?

The population within a 1-mile radius of the site is approximately 32,300.

Ref. No. 18

## PART VI: ACTUAL HAZARDOUS CONDITIONS

There have been no documented releases of hazardous waste associated with the facility. No other actual hazardous conditions pertaining to human or environmental contamination have been documented. Specifically:

- Contamination has not been documented either in organisms in a food chain leading to humans or in organisms directly consumed by humans.
- There have been no documented observed incidents of direct physical contact with hazardous substances at the facility involving a human being (not including occupational exposure) or a domestic animal.
- There have been no documented incidents of damage to flora (e.g., stressed vegetation) or to fauna (e.g., fish kill) that can be attributed to the hazardous material at the facility.
- A fire marshall has not certified that the facility presents a significant threat of fire or explosion and there is no demonstrated threat based on field observation.
- There is no documented contamination of a sewer or storm drain.
- There is no direct evidence of release of a substance of concern from the facility to the groundwater.
- Soil borings and test pits indicate subsurface soil contamination; however, there are no analytical data to support this indication.

Ref. Nos. 1; 2

## PART VII: SITE SUMMARY AND RECOMMENDATIONS

The Elizabeth Coal Gas Site #1 is an active facility located on 3rd Avenue in Elizabeth, New Jersey. The site is comprised of approximately 25 acres which are presently used for gas storage and transfer as well as a computer center and an industrial field operations base.

The site has been owned and operated by Elizabethtown Gas Light Company since 1857. From 1857 to 1911 the facility was used to manufacture coal gas. From approximately 1912 to 1952 carbureted water gas was produced on the site daily, and for peak shaving only from 1952 to 1971 (Ref. No. 20). The manufacturing plant and most of the buildings were removed from the site in 1978. Approximately half of the original site has been sold and is now used by a trucking company. Aerial photographs from 1940 suggest that this half of the site was not used in the coal gasification process. The remaining structures are used primarily for gas mixing, distribution and storage.

Actual waste handling practices used at the plant during the time of coal gas production are largely unknown. It is known, however, that areas of the yard were designated for waste storage. Coal and coke were stored in large piles in the center of the property. Concrete bins were used to separate and store tars, and other oils were kept in aboveground tanks. Tars were removed from the site and sold to asphalt companies and a refinery. Materials which were not marketable, such as poor quality tars and oils, were probably deposited on site in unlined pits. There is reported evidence of these products in the center of the property. It was believed, during the time of gas production, that the coal and coke piles would act as a filter on these waste materials (Ref. No. 1, p. 12). Test pit logs from 1973 and soil boring logs from 1980 indicate that wastes associated with coal gasification have been deposited in on-site soils (Ref. No. 6). Because the material is believed to be underlain by a layer of relatively impermeable clay, no remedial action has been reported to have occurred at the site with the exception of filtration of stormwater runoff (Ref. No. 1, p. 13).

The site is completely surrounded with a barbed wire fence. There is a guard on duty 24 hours a day and plant personnel monitor a closed circuit television scan of the plant's main entrance. There is no known source of potable water supply within 3 miles of the site. Groundwater within 3 miles is not used for drinking or irrigation and there are no known surface water intakes within 3 miles downstream of the site. Storm drains in the area do not discharge directly to surface water. No exposed wastes were observed to be present on the site and no actual hazardous conditions have been documented. The facility no longer manufactures gas and is used only for gas storage and distribution. For the reasons mentioned above, a recommendation of **NO FURTHER REMEDIAL ACTION PLANNED** under CERCLA/SARA is given for the Elizabeth Coal Gas Site #1.

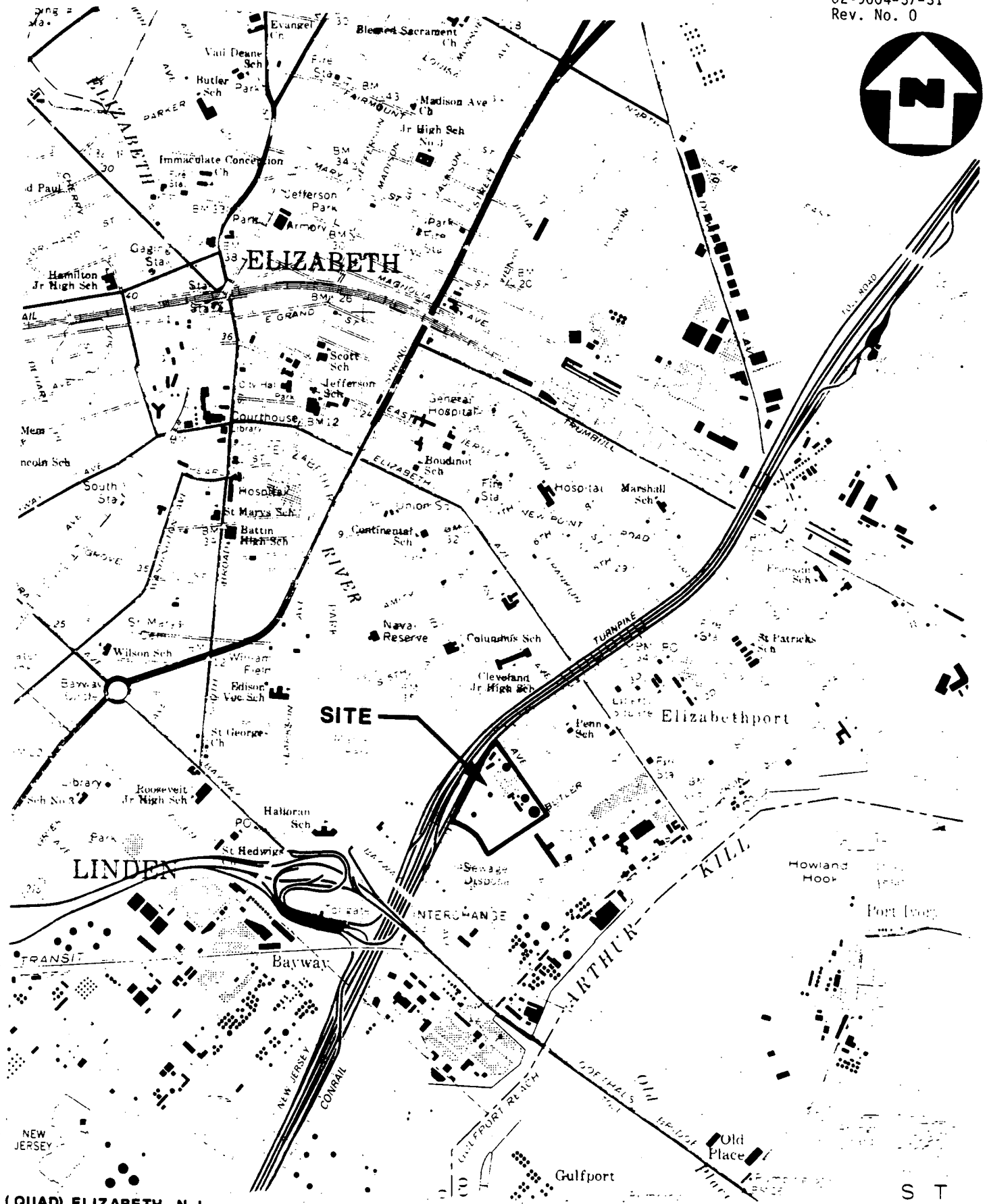


**ATTACHMENT 1**

ELIZABETH COAL GAS SITE #1  
ELIZABETH, NEW JERSEY

Contents

Figure 1:	Site Location Map
Figure 2:	Site Map
Exhibit A:	Photograph Log



(QUAD) ELIZABETH, N.J.

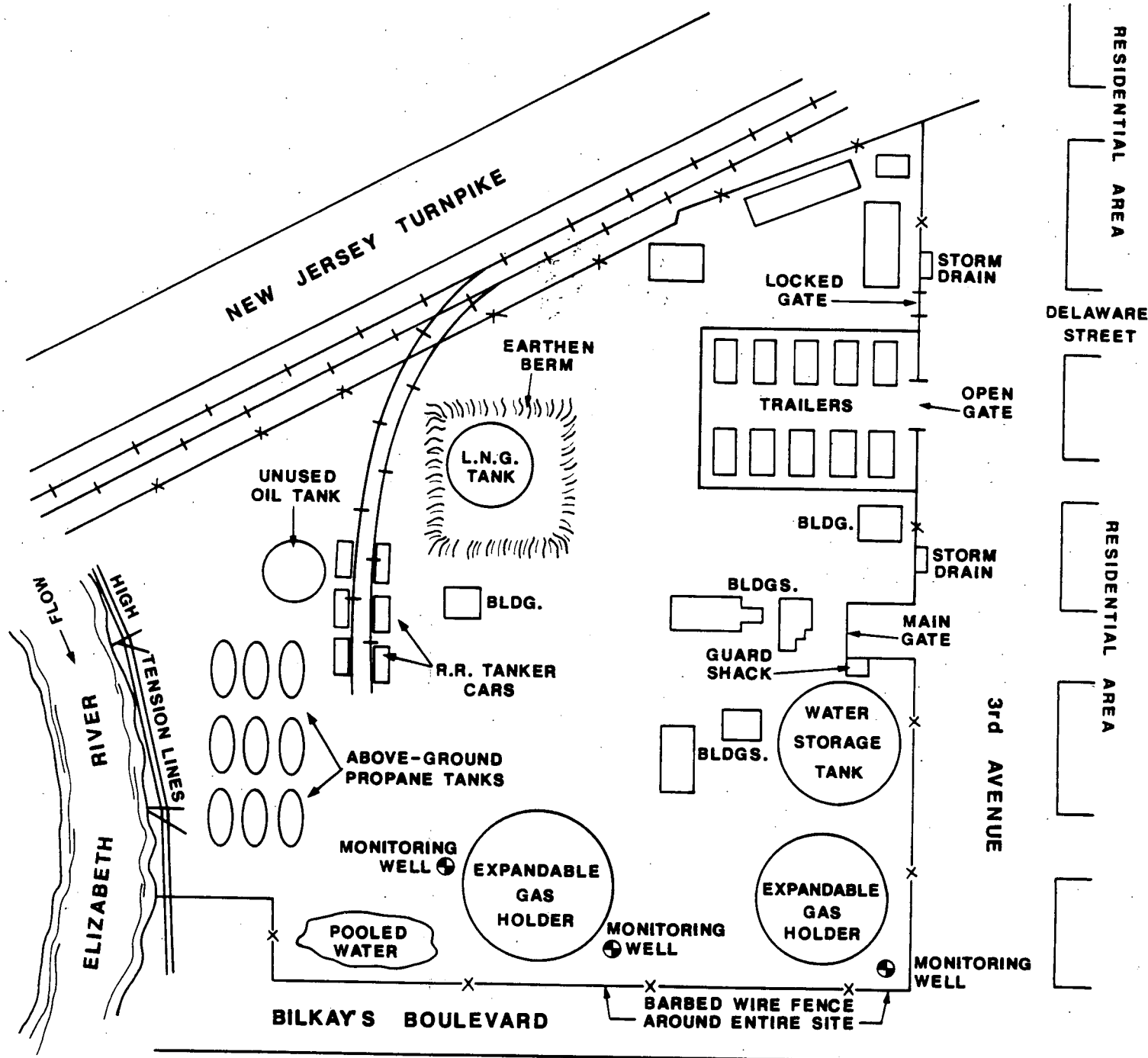
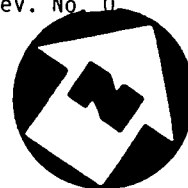
### SITE LOCATION MAP

**ELIZABETH COAL GAS SITE #1, ELIZABETH, N.J.**

SCALE 1"=2000'

FIGURE 1





# SITE MAP

ELIZABETH COAL GAS SITE #1, ELIZABETH, N.J.

NOT TO SCALE

FIGURE 2



EXHIBIT A

PHOTOGRAPH LOG

ELIZABETH COAL GAS SITE #1  
ELIZABETH, NEW JERSEY

OFF-SITE RECONNAISSANCE: MAY 18, 1990

ELIZABETH COAL GAS SITE #1  
ELIZABETH, NEW JERSEY  
MAY 18, 1990

PHOTOGRAPH INDEX

ALL PHOTOGRAPHS TAKEN BY THOMAS VARNER

<u>Photo Number</u>	<u>Description</u>	<u>Time</u>
1P-13	View of site from Delaware Street looking northwest.	1426
1P-14	View of site from Delaware Street looking west.	1426
1P-15	View of site from Delaware Street looking southwest.	1426
1P-16	View of site from Delaware Street looking south.	1426
1P-17	View of site from Delaware Street looking south.	1426
1P-18	View of southeast corner of site looking west down Bilkay's Boulevard.	1434
1P-19	View of adjacent property, looking southeast.	1434
1P-20	View of adjacent property, looking southeast.	1434
1P-21	View of adjacent property, looking southwest.	1434
1P-22	View of adjacent property, looking west.	1434
1P-23	View of site looking northwest from south end of Bilkay's Boulevard.	1439

ELIZABETH COAL GAS SITE #1, ELIZABETH, NEW JERSEY



1P-13

May 18, 1990  
View of site from Delaware Street looking northwest.

1426



1P-14

May 18, 1990  
View of site from Delaware Street looking west.

1426

ELIZABETH COAL GAS SITE #1, ELIZABETH, NEW JERSEY



1P-15

May 18, 1990  
View of site from Delaware Street looking southwest.

1426



1P-16

May 18, 1990  
View of site from Delaware Street looking south.

1426



ELIZABETH COAL GAS SITE #1, ELIZABETH, NEW JERSEY



1P-17

May 18, 1990  
View of site from Delaware Street looking south.

1426



1P-18

May 18, 1990  
View of southeast border of site looking west down  
Bilkay's Boulevard.

1434

ELIZABETH COAL GAS SITE #1, ELIZABETH, NEW JERSEY



1P-19

May 18, 1990  
View of adjacent property, looking southeast.

1434



1P-20

May 18, 1990  
View of adjacent property, looking southeast.

1434



ELIZABETH COAL GAS SITE #1, ELIZABETH, NEW JERSEY



1P-21

May 18, 1990  
View of adjacent property, looking southwest.

1434



1P-22

May 18, 1990  
View of adjacent property, looking west.

1434

ELIZABETH COAL GAS SITE #1, ELIZABETH, NEW JERSEY



1P-23

May 18, 1990  
View of site looking northwest from south end  
of Bilkay's Boulevard.

1439

**ATTACHMENT 2**

## REFERENCES

1. Potential Hazardous Waste Site Preliminary Assessment Report for the Elizabeth Coal Gas Site #1, Malcolm Pirnie, Inc., March 13, 1985.
2. Field Notebook No. 0585, Elizabeth Coal Gas Site #1, TDD No. 02-9004-37, Off-Site Reconnaissance, NUS Corp. Region 2 FIT, Edison, New Jersey, May 18, 1990.
3. Project Note: From R. Settino to File, Subject: Aerial Photos of Elizabeth Coal Gas Site #1, May 24, 1990.
4. Nemickas, B., Geology and Ground-Water Resources of Union County, New Jersey. U.S. Geological Survey, Water Resources Investigations 76-73, June 1976.
5. Miller, D.W., The New Jersey Ground-Water Situation, A Geraghty & Miller Special Report, August 1979.
6. Letter from Barbara Attenburg, P.E., Project Manager, Elizabethtown Gas Company, to Dr. Marwan M. Sadat, P.E., Director, Division of Waste Management, New Jersey Department of Environmental Protection (NJDEP), July 6, 1984.
7. Uncontrolled hazardous waste site ranking system, A user's manual, 40 CFR, Part 300, Appendix A, 1986.
8. Telecon Note: Conversation between Richard A. Sadowski, Elizabethtown Water Co., and W.J. Foss, NUS Corp., February 14, 1990. Re: Groundwater use.
9. Telecon Note: Conversation between Joan Moran, City of Elizabeth Water Utility, and W.J. Foss, NUS Corp., February 14, 1990. Re: Groundwater use.
10. Telecon Note: Conversation between Lisa Balboa, City of Elizabeth Water Department, and Richard Settino, NUS Corp., May 1, 1990. Re: Water Supply.
11. Telecon Note: Conversation between Arlene Potts, Elizabethtown Water Company, and Richard Settino, NUS Corp., May 10, 1990. Re: Water Supply.
12. Telecon Note: Conversation between John Tarasuk, City of Newark Water Department, and Richard Settino, NUS Corp., May 10, 1990. Re: Water Supply.
13. Three-Mile Vicinity Map for Elizabeth Coal Gas Site #1 based on the U.S. Department of the Interior, Geological Survey Topographical Maps, 7.5 minute series, "Elizabeth, NJ" Quadrangle, 1967, revised 1981, "Roselle, NJ" Quadrangle, 1955, revised 1981, "Arthur Kill, NJ" Quadrangle, 1966, revised 1981, and "Perth Amboy, NJ" Quadrangle, 1956, revised 1981.
14. Surface Water Quality Standards, NJAC 7:9-4.1 et seq., May 1985, and NJAC 7:9-4 Index D, Surface Water Classifications of the Passaic, Hackensack and N.Y. Harbor Complex Basin, NJDEP, Division of Water Resources, July, 1985.
15. National Wetlands Inventory, U.S. Department of the Interior, Fish and Wildlife Service, "Elizabeth, NJ" Quadrangle Overlay, based on aerial photography dated October 29, 1976.
16. Atlantic Coast Ecological Inventory, Newark, NJ-NY-PA, U.S. Fish and Wildlife Service, 1980.
17. NJDEP, Division of Water Resources, Water Supply Overlay, Sheet No. 26, 1976.
18. General Sciences Corporation, Graphical Exposure Modeling Systems (GEMS), Landover, Maryland, 1986.
19. Telecon Note: Conversation between Ray Zwarycz, City of Elizabeth Public Works Dept., Engineering Dept., and Richard Settino, NUS Corp., May 22, 1990. Re: Storm drain information.

## REFERENCES (CONT'D)

20. Letter from Russell Fleming, Jr., Executive Vice President and General Counsel, Elizabethtown Gas Company, to Tony Farro, Chief, Bureau of Site Management, NJDEP, September 22, 1983.
21. NJDEP, Division of Water Resources, Bureau of Water Allocation, Water Withdrawal Points and NJGS Case Index Sites within 5.0 miles of Latitude 40° 38' 23" and Longitude 74° 12' 36", June 25, 1988.
22. Federal Register, Vol. 49, No. 16, January 24, 1984, Notices, 2943, Brunswick Shale and Sandstone Aquifer of the Ridgewood Area, New Jersey; Final Determination.

**REFERENCE NO. 1**



PRELIMINARY ASSESSMENT REVIEW FORM

SITE NAME: Elizabeth Coal Gas Site #1  
ALIASES:  
ADDRESS: Erie St. 3<sup>RD</sup> Ave.  
CITY: Elizabeth  
COUNTY: Union  
STATE: NJ  
PRIORITY RATING GIVEN: Medium  
(BY STATE OR CONTRACTOR)

AGREE: ☒  
DISAGREE:  
(CHECK ONE)

IF DISAGREE, WHY?

OTHER COMMENTS:

Available info. indicates on-site disposal of wastes. Physical evidence of wastes on property.

RECOMMENDATION: Medium priority  
FINAL (BY EPA) Conduct SI

Determine status of State actions, if any.

REVIEWER:  
DATE:

Penny Xet  
4/29/85

As per 5/14/85 meeting w/ NJDEP, no SI to be conducted at this time. PRP conducting remedial work. P. Xet 6/85

**MALCOLM  
PIRNIE**

**POTENTIAL HAZARDOUS WASTE SITE  
PRELIMINARY ASSESSMENT**

**NJD981082894**

**Elizabeth Coal Gas Site # 1**

**238**

**Site Name**

**Site ID Number**

**Erie St. 3rd.Ave.**

**Elizabeth, Union County, NJ**

**Address**

**City, State**

**Date of Off-Site Reconnaissance March 7, 1985**

**SITE DESCRIPTION**

Coal gas was manufactured on this site from 1857 through 1911. Water gas was subsequently manufactured here until 1952. Although the actual waste types, quantities and handling methods are unknown, information from the Elizabethtown Gas Company indicates that non-marketable materials (poor quality tar and, oils) may have been buried on-site. Elizabethtown has submitted a Plan for Management of Buried Residual Waste to NJDEP. At present the site is fenced and secured.

**PRIORITY FOR FURTHER ACTION: High      Medium X Low      None**

**RECOMMENDATIONS**

Since there is some potential for employee exposure, the extent of contamination should be verified through soil sampling and test borings at specific site locations.

**Prepared by: Mary S. Manto**

**Date: March 13, 1985**

**Of: Malcolm Pirnie, Inc.**

**REVISED MAY 24 1985**



POTENTIAL HAZARDOUS WASTE SITE  
PRELIMINARY ASSESSMENT  
PART 1 - SITE INFORMATION AND ASSESSMENT

I. IDENTIFICATION  
01 STATE NJ 02 SITE NUMBER 238

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site) Elizabeth Coal Gas Site # 1		02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER Erie St. between 3rd & Florida St.				
03 CITY Elizabeth		04 STATE NJ	05 ZIP CODE 07200	06 COUNTY Union	07 COUNTY CODE	08 CONG. DIST.
09 COORDINATES LATITUDE 40 38 49.2 LONGITUDE 74 11 56.0		BLOCK 5 LOT 1381				

10 DIRECTIONS TO SITE (Starting from nearest public road) NJ Turnpike to 3rd Ave. Take 3rd. Ave. to Florida Street.

III. RESPONSIBLE PARTIES

01 OWNER (If known) Elizabethtown Gas Co.		02 STREET (Business, mailing, residential) One Elizabethtown Plaza			
03 CITY Elizabeth		04 STATE NJ	05 ZIP CODE 08830	06 TELEPHONE NUMBER (201) 2895000	
07 OPERATOR (If known and different from owner)		08 STREET (Business, mailing, residential)			
09 CITY		10 STATE	11 ZIP CODE	12 TELEPHONE NUMBER ( )	
13 TYPE OF OWNERSHIP (Check one) <input checked="" type="checkbox"/> A. PRIVATE <input type="checkbox"/> B. FEDERAL <input type="checkbox"/> C. STATE <input type="checkbox"/> D. COUNTY <input type="checkbox"/> E. MUNICIPAL <input type="checkbox"/> F. OTHER (Specify) <input type="checkbox"/> G. UNKNOWN					

14 OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)

☐ A. RCRA 3001 DATE RECEIVED: MONTH DAY YEAR ☐ B. UNCONTROLLED WASTE (CERCLA 103e) DATE RECEIVED: MONTH DAY YEAR ☒ C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION <input type="checkbox"/> YES DATE MONTH DAY YEAR <input checked="" type="checkbox"/> NO MONTH DAY YEAR CONTRACTOR NAME(S)		BY (Check all that apply) <input type="checkbox"/> A. EPA <input type="checkbox"/> B. EPA CONTRACTOR <input type="checkbox"/> C. STATE <input type="checkbox"/> D. OTHER CONTRACTOR <input type="checkbox"/> E. LOCAL HEALTH OFFICIAL <input type="checkbox"/> F. OTHER (Specify)	
02 SITE STATUS (Check one) <input type="checkbox"/> A. ACTIVE <input checked="" type="checkbox"/> B. INACTIVE <input type="checkbox"/> C. UNKNOWN		03 YEARS OF OPERATION BEGINNING YEAR 1857 ENDING YEAR 1911 <input type="checkbox"/> UNKNOWN	

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED  
Coal tar, benzene, toluene, heavy metals, coke, sulfur, cyanides and assorted polynuclear aromatic hydrocarbon compounds (PAHs) may be on site.

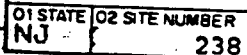
05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION  
Tars and oil products were probably disposed of on-site. Potential exposure exists for employees presently engaged in on-site operations.

V. PRIORITY ASSESSMENT

06 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste information and Part 3 - Description of Hazardous Conditions and Incidents)  
☐ A. HIGH (Inspection required promptly) ☒ B. MEDIUM (Inspection required) ☐ C. LOW (Inspection on time available basis) ☐ D. NONE (No further action needed, complete current disposition form)

VI. INFORMATION AVAILABLE FROM

01 CONTACT Fred Schmitt		02 OF (Agency/Organization) NJDEP/BEERA		03 TELEPHONE NUMBER (609) 2921215	
04 PERSON RESPONSIBLE FOR ASSESSMENT Mary S. Manto		05 AGENCY	06 ORGANIZATION M. Pirnie Inc	07 TELEPHONE NUMBER (914) 6942100	08 DATE 3/13/85 MONTH DAY YEAR

[illegible]

EPA FORM 2070-12(7-81)

## POTENTIAL HAZARDOUS WASTE SITE

POTENTIAL HAZARDOUS WASTE SITE  
PRELIMINARY ASSESSMENT

## PART 3-DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

## 1. IDENTIFICATION

01 STATE NJ 02 SITE NUMBER 238

## II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☒ A. GROUNDWATER CONTAMINATION02 ☐ OBSERVED (DATE: \_\_\_\_\_)☒ POTENTIAL☐ ALLEGED

03 POPULATION POTENTIALLY AFFECTED: \_\_\_\_\_

04 NARRATIVE DESCRIPTION

Materials deposited on the ground or buried may, through precipitation, leach into the groundwater table. However, the aquifer within a 3-mile radius reportedly has no known use. (Attach. A).

01 ☒ B. SURFACE WATER CONTAMINATION02 ☐ OBSERVED (DATE: \_\_\_\_\_)☒ POTENTIAL☐ ALLEGED

03 POPULATION POTENTIALLY AFFECTED: \_\_\_\_\_

04 NARRATIVE DESCRIPTION

Potential for contaminated runoff or groundwater exfiltration to enter the Elizabeth River along the western boundary of the site.

01 ☒ C. CONTAMINATION OF AIR02 ☐ OBSERVED (DATE: \_\_\_\_\_)☒ POTENTIAL☐ ALLEGED

03 POPULATION POTENTIALLY AFFECTED: \_\_\_\_\_

04 NARRATIVE DESCRIPTION

Materials adsorbed into surface soil particles may be transported via air.

01 ☒ D. FIRE/EXPLOSIVE CONDITIONS02 ☐ OBSERVED (DATE: \_\_\_\_\_)☒ POTENTIAL☐ ALLEGED

03 POPULATION POTENTIALLY AFFECTED: \_\_\_\_\_

04 NARRATIVE DESCRIPTION

Potential in areas where pooled underground deposits of tar and oil are adjacent to buried electric cables or heat sources.

01 ☒ E. DIRECT CONTACT02 ☐ OBSERVED (DATE: \_\_\_\_\_)☒ POTENTIAL☐ ALLEGED

03 POPULATION POTENTIALLY AFFECTED: \_\_\_\_\_

04 NARRATIVE DESCRIPTION

Potential through dermal and inhalation exposure routes by on-site workers.

01 ☒ F. CONTAMINATION OF SOIL02 ☐ OBSERVED (DATE: \_\_\_\_\_)☒ POTENTIAL☐ ALLEGED

03 AREA POTENTIALLY AFFECTED: \_\_\_\_\_

04 NARRATIVE DESCRIPTION

Materials buried or deposited on ground may be leached into the soil via precipitation. (Above)

01 ☐ G. DRINKING WATER CONTAMINATION02 ☐ OBSERVED (DATE: \_\_\_\_\_)☐ POTENTIAL☐ ALLEGED

03 POPULATION POTENTIALLY AFFECTED: \_\_\_\_\_

04 NARRATIVE DESCRIPTION

01 ☒ H. WORKER EXPOSURE/INJURY02 ☐ OBSERVED (DATE: \_\_\_\_\_)☒ POTENTIAL☐ ALLEGED

03 WORKERS POTENTIALLY AFFECTED: \_\_\_\_\_

04 NARRATIVE DESCRIPTION

Since there are people working at the facility, there is some potential for dermal and inhalation exposure through contaminated soils.

01 ☐ I. POPULATION EXPOSURE/INJURY02 ☐ OBSERVED (DATE: \_\_\_\_\_)☐ POTENTIAL☐ ALLEGED

03 POPULATION POTENTIALLY AFFECTED: \_\_\_\_\_

04 NARRATIVE DESCRIPTION



POTENTIAL HAZARDOUS WASTE SITE  
PRELIMINARY ASSESSMENT

PART 3-DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION

01 STATE 02 SITE NUMBER

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☐ J. DAMAGE TO FLORA

02 ☐ OBSERVED (DATE: \_\_\_\_\_)

☐ POTENTIAL

☐ ALLEGED

04 NARRATIVE DESCRIPTION

01 ☐ K. DAMAGE TO FAUNA

02 ☐ OBSERVED (DATE: \_\_\_\_\_)

☐ POTENTIAL

☐ ALLEGED

04 NARRATIVE DESCRIPTION (Include name(s) of species)

01 ☐ L. CONTAMINATION OF FOOD CHAIN

02 ☐ OBSERVED (DATE: \_\_\_\_\_)

☐ POTENTIAL

☐ ALLEGED

04 NARRATIVE DESCRIPTION

01 ☒ M. UNSTABLE CONTAINMENT OF WASTES  
(Spills/runoff/leaking liquids/leaking drums)

02 ☐ OBSERVED (DATE: \_\_\_\_\_)

☒ POTENTIAL

☐ ALLEGED

03 POPULATION POTENTIALLY AFFECTED: \_\_\_\_\_

04 NARRATIVE DESCRIPTION

Tar and oil residues buried on-site are most likely contained in unlined underground pools or as pockets of contaminated groundwater and soil.

01 ☐ N. DAMAGE TO OFFSITE PROPERTY

02 ☐ OBSERVED (DATE: \_\_\_\_\_)

☐ POTENTIAL

☐ ALLEGED

04 NARRATIVE DESCRIPTION

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs

02 ☐ OBSERVED (DATE: \_\_\_\_\_)

☐ POTENTIAL

☐ ALLEGED

04 NARRATIVE DESCRIPTION

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING

02 ☐ OBSERVED (DATE: \_\_\_\_\_)

☐ POTENTIAL

☐ ALLEGED

04 NARRATIVE DESCRIPTION

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

III. TOTAL POPULATION POTENTIALLY AFFECTED: \_\_\_\_\_

IV. COMMENTS

The quantity, location and nature of waste materials possibly buried on-site are presently unknown. An assessment of the magnitude and extent of potential hazards can only be generally concluded at this time.

V. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

NJDEP/HSMA: Attachments A, B, and E

Sax: Attachment C

February 7, 1985 off-site reconnaissance (OSR)

QUAD ELIZABETH  
SITE 238

Lat: 40° 38' 49.2"  
Long: 74° 11' 56.0"







ELIZABETH RIVER

PROPANE  
STORAGE  
TANKS

OLD  
TANK

GAS  
HOLDER

LNG  
TANK

BLDG.

BLDG.

OFFICES

LEASED  
PARKING  
STORAGE

BLDG.

BLDG.

BLDG.

WATER  
STORAGE

GAS  
HOLDER

3RD AVE.

N.J. TURNPIKE

ROCKAWAY RIVER

ERIE STREET PLANT

ELIZABETH, N.J.

BARRY TRUCK  
TERMINAL

GEORGE  
ST.

ALBION  
ST.

ERIE  
ST.

BRIDGE  
ST.

FORMER GAS MANUFACTURING PLANTS

SITE: #1, Elizabeth, NJ

LOCATION: 3rd Ave. at Florida St.

SIZE: 25 acres ±

PRESENT OWNERSHIP: Elizabethtown Gas Co. since 1857

PRIOR OWNERSHIP:

WELLS: None in vicinity

WATER COURSES: Elizabeth River 160'

HEALTH DEPT.: City of Elizabeth

PRESENT LAND USE: Gas Storage and Transfer, Computer Center.  
Industrial Field Operations Base, Other  
Storage.

ADJACENT LAND USE: 1300' of Residential/Light Industrial Frontage  
1400' ConRail and NJ Turnpike Frontage  
700' Elizabeth River Frontage  
1000' Trucking Terminal

APPROXIMATE DATES OF PLANT OPERATION: 1857-1952  
Used for peak shaving 1952-1971

## NJ DEP INFORMATION REQUEST

### ERIE STREET PLANT

#### I. SITE BACKGROUND

1. Location: 3rd Ave. at Florida St., Elizabeth  
Map attached.
2. Site Description:
  - a. See sketch.
  - b. Buildings and tanks are as indicated on sketch in 2.a. The entire property is secured with chain link fence and 24 hour guard. The yard is mostly covered by crushed stone and fill.
3. History of Ownership and Use:
  - a. Elizabethtown Gas Co. has owned the property since 1857. Gas was manufactured until 1952 on a daily basis. From 1952 until 1971 gas was only manufactured on the coldest winter days when it was needed to help meet demand. The manufacturing plant and most of the buildings were removed in 1978. The remaining structures include two large vacant brick buildings which are used for gas mixing and distribution operations (including propane/air and LNG), three buildings which are used for part of the operations function and for the gas dispatching control center, a water pump house for the fire protection system, a water storage tank, two gas holders, a battery of propane storage tanks and a liquified natural gas storage tank, and an unused oil tank.
  - b. Although actual waste handling practices at the plant are largely unknown, areas of the yard were designated for waste storage. Concrete bins were used to separate and store tars and other oils were kept in above ground tanks. In the early days of the plant's operation (prior to 1920's) tars were removed by rail car and sold to asphalt companies and a refinery. Tars were later sold and transported off-site by truck.
  - c. Materials which were not marketable, such as poor quality tars which were recovered from the machinery when it was cleaned and oils which were pumped out of the mains in a mixture of water, were probably deposited on the site. There is evidence of these products in the center of the property where the coal and coke piles were. It was thought that coal and coke would act as a filter on these waste materials.

3. d. Since the material is buried and underlain by a layer of relatively impermeable clay, no remedial action has been taken other than filtration of stormwater run-off.
- e. On April 17, 1984 a citation was issued for a violation of 33USC1161 during the start up test for a new fire protection system at the plant.
4. It is expected that future use of the site will be the same as present use.

## II. SITE CHARACTERISTICS

### A. Land Use:

1. The site is situated in an area with mixed urban/industrial/commercial land use. Northeast of the site, across 3rd Avenue, there is a residential area. To the southeast is a highly industrialized area including a truck terminal and chemical storage yards. ConRail and the Turnpike border the property on the northwest and the Elizabeth River runs southwest of the property. The Arthur Kill is within a mile of the site.
2. The average population density within a 2 mile radius of the plant is approximately 7,000 people per square mile.
3. The site is secured by 8 foot chain link fencing topped with barbed wire. A guard is on duty 24 hours a day and plant personnel monitor a closed circuit television scan of the plant main entrance.

### B. Site Terrain:

1. Average slope of the site is less than 2%. See topographic map.
2. The nearest downslope surface water is the Elizabeth River. At this location there is significant tidal influence on the river. It joins the Arthur Kill within a mile of the site and there is no known use of this body of water for other than shipping.
3. The terrain slopes slightly toward the river, however the Corps of Engineers has built a 12-15 foot high embankment between the river and the site.

4. The site ranges from 6 to 12 feet above sea level. Adjacent properties are at the same general elevations with the exception of the Turnpike and ConRail which are much higher.

C. Ground and Surface Water Use

1. There are no known uses of the aquifer underlying the site within a three mile radius. Our search did not indicate any well records.
2. There are no known potable wells within 3 miles of the site.
3. There are no water-supply wells within 3 miles of the site.
4. Uses of surface water within 3 miles of the site are restricted to shipping.
5. There are no surface water supply intakes within 3 miles downstream of the site.

D. Site Contamination

- a. See boring data.

## I. PROCESS DESCRIPTION AND BY-PRODUCT & WASTE HANDLING

### A. Process Description

#### 1. Oil Gas

Oil gas is the thermal cracking and reforming of a liquid hydrocarbon. Oil gas is produced in a three vessel system similar to the carbureted water gas machines. Checker brick replaces the coke bed in the generator and the generator and carburetor are used as vaporizers. The vaporizers are alternately heated with a liquid fuel and process another liquid fuel into the superheater where the thermally cracked hydrocarbon is reformed into methane, ethane, ethylene and other higher hydrocarbons. Oil gas has a thermal value of approximately 1100 Btu/ft. The by-product from this process is tar.

2.

#### Coal Gas

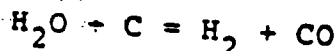
Coal gas is manufactured through the thermo-decomposition of the volatile matter in coal. It is generated in equipment called retorts, benches and coke ovens. The coal gas produced from the thermo-decomposition is high in hydrogen and methane and contains lesser amounts of ethane, ethylene, ammonia, hydrogen sulfide, water, carbon monoxide, carbon dioxide, tar, fixed carbon, and other hydrocarbons.

The by-products of coal gasification are ammonia, ammonium sulphate, tar, light oils, coke and sulfur.

3.

#### Water Gas

Water gas is manufactured by passing steam over and through an incandescent bed of hot coke, coal or other carbonaceous material. The manufacturing equipment consists of a generator, waste heat boiler and a wash box. The generator contains the coke bed; the waste heat boiler is used to extract heat from the gas produced or from the products of combustion when heating the coke bed and the wash box is used to cleanup the gas of all condensables. Water gas consists essentially of hydrogen and carbon monoxide which is formed in the following chemical reaction.



ATTACHMENT B

The thermal value of water gas is approximately 380 Btu/ft. The by-product from water gas manufacturing is ash and clinker.

4. Carbureted Water Gas

Carbureted water gas is the water gas process enriched with a thermally cracked hydrocarbon such as oil, natural or liquified petroleum gas. The manufacturing equipment consists of a generator, carburetor, superheater, waste heat boiler and wash box. The generator contains the coke bed used for generating the water gas and providing heat to the carburetor and superheater. The carburetor is where the hydrocarbon is added, usually vaporizing and being thermally cracked on checker brick installed in the carburetor. The superheater, also filled with checker brick, is where the thermally cracked hydrocarbon is reformed into methane, ethane and other gaseous hydrocarbons. The thermal value of carbureted water gas is approximately 560 Btu/ft. The by-products from the carbureted water gas reaction are clinker, tar, pitch, and light oil.

B. By-Products and Waste Handling

1. Ash

Ash, the residue remaining from the burning of soft and hard coals, was generated in the steam producing portion of all gas plants up to about 1945, when the boilers were converted to liquid fuels.

Ash was normally removed from the property in bulk by contractors who trucked the material to landfills.

2. Clinker

Clinker is the residue remaining from the coke used in the water gas and carbureted water gas operations.

Clinker was normally removed and disposed of in the same fashion as ash.

3. Iron Oxide Sponge

Iron Oxide Sponge was used in all gas plants for the removal of hydrogen sulfide from the manufactured gas stream. The sponge was normally regenerated with air to reactivate

the material. However, over the years great quantities of this material became waste because it could no longer be regenerated.

Spent Iron Oxide Sponge was normally removed from the property in bulk by contractors.

4. Coke

Coke was a by-product from the coal gas plants the result of the thermo decomposition of coal. Coke was sold to the gas industry, the steel industry, residential, commercial, and industrial consumers who utilized it for fuel.

Coke was transported from the plants via barge, rail and trucks. In some instances, it was bagged for retail sale.

5. Water Gas, Carbureted Water Gas & Oil Gas Tar

Tar was removed from the manufactured gas stream usually as an emulsion with water. It was initially stored in tar wells (separators) and tanks where the water was removed. Tar was sold to the road paving industry, the building material industry, and was used in-plant for boiler fuel.

Tar was transported via tank truck, rail car, and barge to the above listed industries.

6. Coal Gas Tar

Tar was removed from the manufactured gas stream in the ammonia liquor stream. Dry tar was separated from the ammonia liquor and stored in tanks. The tar was then sold to the chemical industry for recovery of the valuable chemicals in the tar by-product. After chemical recovery, the remaining tar was sold principally to the paving industry.

Tar was transported from the plants via tank truck, rail car, and barge to the chemical industry.

7. Pitch

Pitch or tar heavies resulted from the processing of tar for the paving industry.



This by-product was sold to the electrolytic industry, both domestic and foreign, for the manufacture of electrodes.

Pitch was transported from the plants via trucks or barge. Foreign bound pitch was transported via truck to ships for sea transportation.

8. Drip Oil or Light Oil

Drip oil was removed from the manufactured gas stream usually by condensers and precipitators, collected, processed for water removal, and stored in tanks. Coal gas drip oil was sold to the chemical industry, whereas carbureted water gas drip oil was mixed with the tar by-product and sold with the tar.

Drip oil, when sold independently, was transported from the plant via tank truck.

9. Ammonium Sulphate

Ammonium sulphate was removed from the manufactured coal gas stream usually in a liquid purification system. The sulphate was dried and stored in buildings for sale to the fertilizer industry.

The material was shipped from the plant in bulk via truck or barge to the various fertilizer plants.

10. Flotation Sulfur

Flotation sulfur was removed from the manufactured coal gas stream by a liquid purification system. The sulfur was then further dried in presses and loaded into wooden barrels for sale as a pesticide to individual farmers or farm cooperatives for spraying on fruit trees.

The sulfur barrels were transported via truck or barge to their destination.

11. Ammonia Liquor

Ammonia liquor was the result of washing the manufactured coal gas stream with water. The liquor was then disposed of prior to 1950 by mixing with cooling water effluent and discharged

to the nearest waterway. After 1950, this  
effluent was discharged to the local sewer plants.

ELIZABETHTOWN GAS COMPANY  
PLAN FOR MANAGEMENT OF BURIED RESIDUAL WASTE

INTRODUCTION AND SCOPE:

On August 22, 1983, the New Jersey Department of Environmental Protection (NJ DEP) alerted Elizabethtown Gas Company (the Company) of potential hazards associated with waste products from gas manufacturing facilities, specifically coal tar, and requested information on gas manufacturing facilities within the Company's franchised service territory. Elizabethtown Gas Company was able to develop a list of ten sites of former gas manufacturing facilities, five of which were operated by Elizabethtown Gas Company. The Company now owns only three of the five sites and one other which was operated prior to the Company's purchase of the property.

It is the Company's intention to assess the possible health hazards which may exist on each of the five sites on which the Company operated gas manufacturing facilities and on the sixth site which the Company now owns but never operated. Remedial measures will be developed where the assessment of the extent of buried residual wastes and the hazards associated with the same indicates such measures are necessary to comply with Federal and State regulations and to insure the health and safety of the public. The

Company further intends to cooperate with the efforts of NJ DEP's researching of the problem by gathering preliminary data on the four other former gas manufacturing sites within the Company's service area.

Elizabethtown Gas Company's Plan for Management of Buried Residual Waste is divided into two phases.

Phase I - Problem Definitions will explore and delineate the conditions at each site, resulting in a Hazardous Risk Assessment Report. Because testing must encompass seasonal variations it is expected that Phase I may last slightly more than one year. These findings will be used as the basis for Phase II - Remedial Action in which corrective measures will be developed, financed and implemented.

THE PLAN:

I. PHASE I - PROBLEM DEFINITION

A. Preliminary Investigation

1. Identification and Description of  
Former Gas Manufacturing Sites

- a. Location - Street, Town, Health Department with jurisdiction, aerial photography showing site in relation to surrounding area.
- b. Ownership - Present owners, past owners, adjacent land ownership.

THE PLAN (cont'd)

- c. Land-use - Description of present operations, public vs. private, physical structures, pavement, public exposure, water sources, wells, site specific location of buildings of past and present operations.
- d. Topography - Drainage, adjacent water courses or containment areas, slope, percolation, structures.
- 2. Prioritization of Sites
  - a. Proximity of wells - Potable and non-potable.
  - b. Land-use and Adjacent Land-use - Recreation, public gathering, livestock.
  - c. Other criteria as indicated by NJ DEP.
- 3. Review of Available Scientific Data
  - a. Geology - Strata density and depths, slope, soils, permeability and porosity, etc., obtained from regional studies or borings for other projects such as specific structures or Army Corps public works projects.
  - b. Hydrology - Flow velocity and volumes at various depth, seasonal variations,

## BURIED RESIDUAL WASTE

Page 4

### THE PLAN (cont'd)

#### b. Hydrology (cont'd)

water quality, aquifier identification, etc., as can be obtained from regional and other specific reports which may exist.

- #### c. Area of Contamination -
- Based on available records or individual recollections of gas manufacturing operations, "hot spots" will be delineated for testing.

### B. Site Testing

#### 1. Tests for Type and Degree of Contamination

- ##### a. Air -
- OVA testing of atmosphere over potential "hot spots", grid testing over site, adjacent water courses or containment areas.
- ##### b. Groundwater -
- Test well sampling to determine water quality near "hot spots", at strategic points within property, on borders of property and off-site for background levels and monitoring. Nearby potable and non-potable wells will be tested for contamination.
- ##### c. Water Courses or Containment Areas -
- Sampling to determine water quality as affected by the site and to de-

THE PLAN (cont'd)

c. (cont'd)

termine background levels of contamination, if any.

- d. Soils - Tests for tar content to be taken at "hot spots" and other points over property where possibility of contamination exists.

Other tests will be made as needed to quantify intensity of contamination.

2. Tests to Establish Physical Parameters of Site

- a. Geology - Borings and test pits to establish underground structure.
- b. Hydrology - Groundwater monitoring and measurement to conclusively determine underground hydrology.
- c. Area of Contamination - Determination of contaminant plumes, extent of on-site waste disposal and rate of dispersion by means of test wells and other test methods such as electric resistance testing, soil sampling or other tests.

C. Hazardous Risk Assessment Report

1. All information to be summarized and analyzed for each site.

THE PLAN (cont'd)

2. Independent opinions to be obtained to objectively evaluate risks and to verify test methods, validity and conclusions for each site.

II - PHASE II - REMEDIAL ACTION

- A. Development of Remedial Measures - some typical alternatives may include on-site treatment, removal, or containment.
- B. Secure funding to carry out the chosen remedial action; i.e. rate increase.
- C. Implementation of Remedial Measures
- D. Monitoring for Effectiveness



## MEETING ATTENDANCE SHEET

SUBJECT		DATE
FORMER COAL GASIFICATION PLANT INVESTIGATIONS		4-1-85
MEETING LOCATION		
425 E STATE ST CARROLL BUILDING		
GROUP(S) ATTENDING		DEP DIVISION OR UNIT
ELIZABETHTOWN GAS / H-SMA		H-SMA
PLEASE PRINT ALL INFORMATION CLEARLY		

[illegible]

FORMER GAS MANUFACTURING PLANTS  
IN ELIZABETHTOWN GAS COMPANY'S  
SERVICE TERRITORY

1. Elizabeth, NJ  
Owned by Elizabethtown, 3rd Ave. at Florida St.  
Operated by Elizabethtown
2. Elizabeth, NJ  
Owned by Elizabethtown 406 South St.  
Operated by Elizabethtown
3. Rahway, NJ  
Owned by others 219-245 Central Ave.  
Operated by Elizabethtown
4. Perth Amboy, NJ  
Owned by others Linden St. at Sadowski Parkway  
Operated by Elizabethtown
5. Flemington, NJ  
Owned by Elizabethtown E. Main St. near Rte. 31  
Operated by Elizabethtown (4 yrs.)  
and others
6. Newton, NJ  
Owned by Elizabethtown Diller Ave.  
Operated by Elizabethtown (2 yrs.)  
and others
7. Newton, NJ  
Owned by others E. Clinton Ave.  
Operated by others
8. Lambertville, NJ  
Owned by others So. Main St.  
Operated by others
9. Washington, NJ  
Owned by others So. Lincoln St.  
Operated by others
10. Phillipsburg, NJ  
Owned by others Railroad Tracks at Reese Ct.  
Operated by others

~~FORMER~~ COAL GASIFICATION FACILITIES  
IDENTIFYING MEMORANDUM  
SEPTEMBER 20, 1983

GENERAL OVERVIEW

An investigation by the Division of Waste Management's Bureau of Field Operations of a surface water pollution problem in Belmar, Monmouth County, led investigators to what was a Coal Gasification Facility. Further investigation indicated that the problem may be State wide in that most every established city in the early 1900's had a local gas plant that could have similar problems as the Belmar site.

There were basically three types of gas plants that operated throughout New Jersey and the country, during the late 1880's and early 1900's, oil, coal and coke. Coal or coke was used as the raw material in the 1800's and oil for the most part, was not used as a feed material until the 1930's and 40's. The basic process for all the plants involved heating the oil, coal or coke to drive off volatile gases which became the product for use. However, this process also produced coal tar or oil still bottoms as a by-product. For the most part, this material was considered a waste and disposed of on and off the site. However, around 1920 the tars did begin to have some commercial use wood treating, chemical feedstocks and road material.

The coal tars and still bottoms contain significant concentrations of polynuclear aromatic hydrocarbons (PAHs). This group of organic compounds includes, pyrenes and anthracenes, among others, and known and suspected carcinogens. The material is not considered to be highly mobile in the aquatic environment but under certain conditions individual components of the material can readily migrate through ground and surface water. Components of the material also readily volatilize into the air producing pungent odors.

Due to the disposal practices at the time, namely, disposal in open pits and the current knowledge of the hazards of the material the Department has instituted a State wide investigation of these sites. Initially, we will be identifying the sites and gathering all the available information on each of them. Once identified an initial assessment can be performed to prioritize the sites for future remedial actions, if needed. To date, we have identified 43 potential sites in the State, of those 11 are actively being investigated and evaluated.

Current Status

A list of the sites identified to date is attached. Individual status sheets for the active sites are also attached.

All the utility companies have responded to the Commissioner's August 22 letter.

South Jersey Gas actually sent their own letter prior to the Commissioner's identifying 12 sites where coal tars may have been generated, 6 have been confirmed as manufacturing sites. At a meeting with SJG on September 14, Mr. Kindle, VP, expressed a willingness to hire a consultant to evaluate all the sites. He stated he would have to contact other parties that are involved

ATTACHMENT E

before SJG could commit to the studies. Some of SJG's Sites were operated by PSE & G.

Of SJG's sites, Atlantic City - Kirkman Blvd. and Glassboro are considered active cases.

New Jersey Natural Gas and Jersey Central Power and Light have agreed to work together. They currently have 10 sites between them, 9 have been confirmed. JCP&L has taken the lead for the two companies and has begun extensive work on the Belmar Site and has issued a RFP for the Long Branch Site. NJNG is currently involved in remedial action negotiations with the Division of Water Resources on the Dover Site. Both companies are searching their records for more information and HSMA should be meeting with them next week. NJNG bought their most, if not all, their sites from JCP&L and thus the cooperation.

Atlantic City Electric never operated any Coal Gas Facilities, however, they currently own the NJNG/JCP&L Ocean City site and have contracted Roy F. Weston to study the site. A preliminary report is due within the next month.

Public Service Electric & Gas has confirmed 8 sites 3 of which still exist. They are still searching their records for information and should be ready to meet with HSMA next week.

Elizabethtown Gas has confirmed 8 sites. In a meeting on September 16, Mr. Fleming, VP, stated he is willing to contract for a consultant to evaluate the sites, he only has to convince the company to make the commitment. E-Town Gas has retained David Bardin as their attorney for this matter. Some of Elizabethtown's sites were operated by JCP&L or one of their corporate predecessors.

SEPTEMBER 20, 1983  
COMPILED BY: NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION  
HAZARDOUS SITE MITIGATION ADMINISTRATION

COAL GASIFICATION PLANTS

South Jersey Gas Company

1. Atlantic City - Kirkman Boulevard
2. Atlantic City - Florida, Georgia and Sunset Avenues
3. Pleasantville - Franklin Avenue
4. Egg Harbor - Atlantic and Buffalo Avenues
5. Hammonton - Twelfth Street
6. Bridgeton - Vine and Water Streets
7. Millville - North Second Street
8. Glassboro - Union and Grove Streets
9. Paulsboro - Jefferson Street east of Billingsport Road
10. Swedesboro - Auburn Road and Bridgeport Road
11. Penns Grove - Pitman Street and the Railroad Tracks
12. Salem - Fifth and Howell Streets

New Jersey Natural Gas Company/Jersey Central Power & Light

1. Dover in Morris County - Carrol Street
2. Belmar - 16<sup>th</sup> and Railroad
3. Cape May City - Lafayette and St. John Streets
4. Ocean City - 11<sup>th</sup> & West (Atlantic City Electric)
5. Long Branch - Long Branch Avenue & Brook Street
6. Lakewood - Clover Street & Laurel Avenue
7. Toms River - Water Street
8. Wildwood - West Barfield & Lincoln Avenue

Public Service Electirc & Gas

1. Camden City - 2<sup>nd</sup> & Spruce Street
2. Trenton - New York & Sylvester Street
- \*3. Edison - New Brunswick - 410 Silver Lake
- \*4. Harrison - 4<sup>th</sup> Street
- \*5. Jersey City (West end) - St. Paul & Duffield
6. Patterson - 200<sup>th</sup> & 5<sup>th</sup> Street
7. Newark - Market Street

Elizabethtown Gas

1. Elizabeth - Erie Street between Third & Florida
2. Elizabeth - at South Street & Center Streets
3. Perth Amboy at Margeret Street
4. Rahway intersection Central, Hamilton, Irving
5. Flemington at E. Main Street
6. Nwton at Driller Avenue
7. Lambertville at S. Main at Ferry Street
8. Washington Boro (Warren) S. Linclon at R.R. Tracks

Other Sites

1. Atlantic Highlands - Leonard Avenue
2. Kearny - Koppers Coke
3. Kearny - Fish House Road
4. Princeton - Whitherspoon Street
5. Asbury Park - Sewell & Prospect Street
6. West Paterson - Memorial Drive
7. Tuckahoe
8. Jersey City - Newport City Project

\*Still existing

The overlapping of some of the sites is a result of an act requiring PSE&G and JCP&L to divest their gas holdings. This occurred around 1950 and the plants only operated for a short time afterwards. Because of this it seems the smaller gas companies might look toward the larger utility companies for money.

We hope that the companies can work among themselves to achieve a funding scheme. However, if it becomes necessary to institute expensive remedial actions at these sites the "Who's Going to Pay" may become a major problem. To try to avert this situation we would like to involve the BPU and Public Advocate in this project now. This will aid us in two ways. One, smoothing the way for the facilities to get any rate hikes needed to pay for remedial action and second allowing us to use the BPU's influence to achieve our desired results from the companies.

None of the sites to date can be classified as imminent hazards and from what information has been gathered none of the sites will be imminent hazards. For the most part the main concern will be worker and residential exposure from the current and future uses of these sites. Contamination of potable water at this time is not a problem the vast majority of the sites are in areas served by public water supplies. Ground and surface water contamination is anticipated to be an environmental concern rather than a public health concern.

**MALCOLM  
PIRNIE****OFF - SITE RECONNAISSANCE**Date: MARCH 7 1985Time In 9:30 Out 10:02Site ID No. 238Site Name: ELIZABETH COAL GAS SITE 1Location: 3RD AVE AND FLORIDA STREETAddress: ELIZABETHCity, County: UNION COUNTY

Zip: \_\_\_\_\_

Personnel: TONY RUSSONICK ROTONDATitle: ENVIR. ScientistCIVIL EngineerConditions: SUNNY, CLEARTemperature: 45°FAny evidence of imminent hazard? NOIllegal Dumping? NOUncapped Monitoring Wells? NO

If Yes, Notify NJDEP

Signature: Nicholas P. ArtomachDate: MARCH 7, 1985Witness: Chetey R...Date: 3/7/85



Site: ELIZABETH COAL GAS SITE 1. Site ID No. 238

Date: MARCH 7, 1985

ACTIVE SITE. SEVERAL MONITORING WELLS.  
THREE LARGE RISE AND FALL TANKS. BUILDINGS  
ALL FENCED IN. RAILROAD SPUR INTO SITE.  
NO COAL WASTE NOTED.

Signature:

*Nicholas P. Constant*

Date:

MARCH 7, 1985

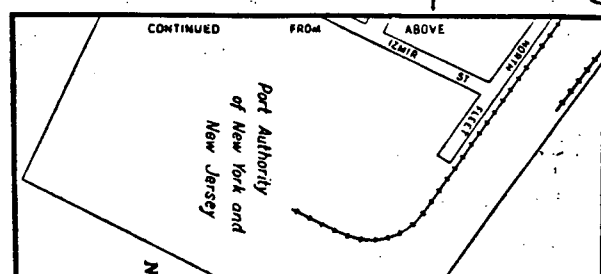
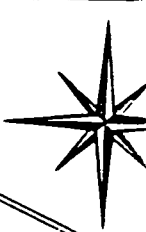
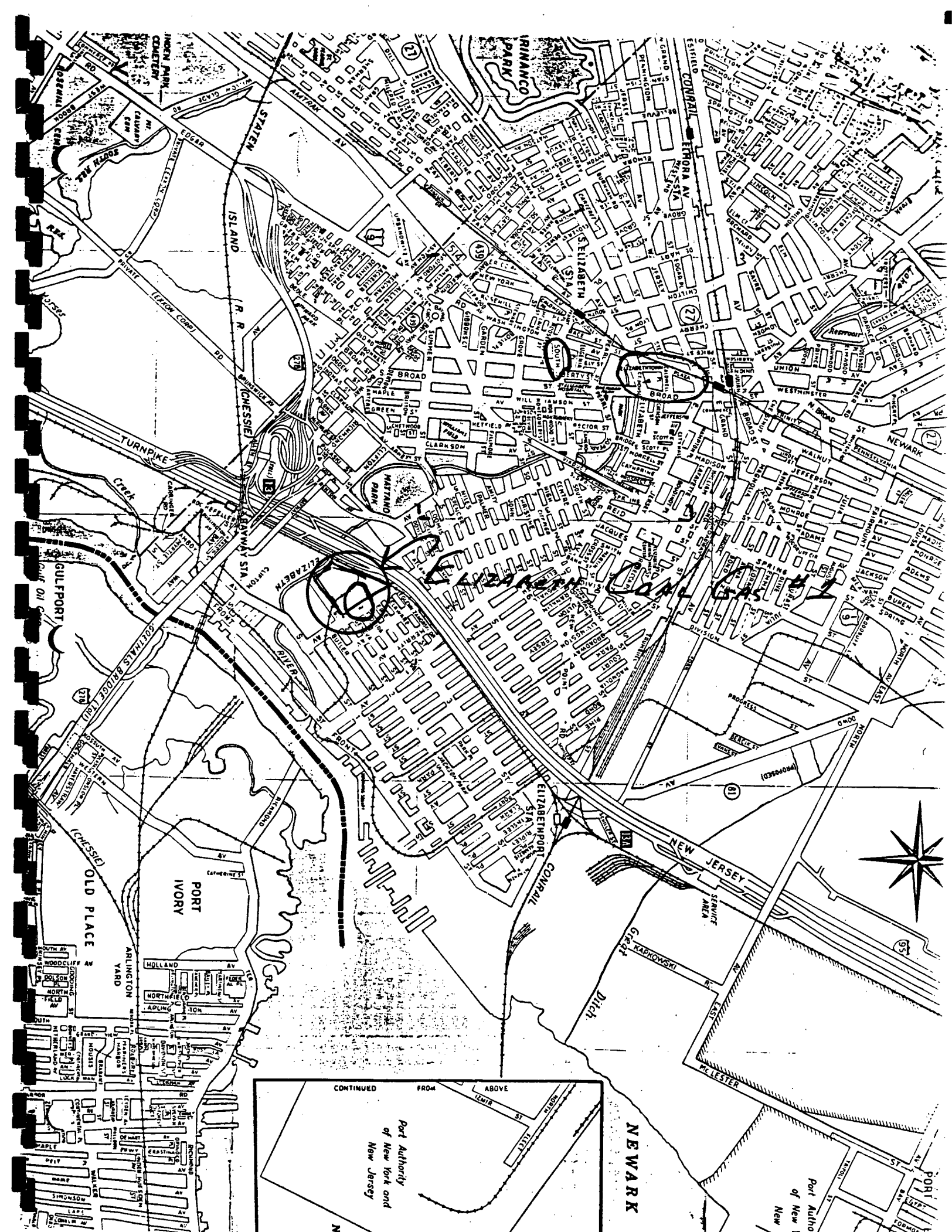
Witness:

*Anthony Russo*

Date:

3/2/85





CONTINUED FROM ABOVE

Port Authority  
of New York and  
New Jersey

NEWARK

Port Autho  
of New  
New

**REFERENCE NO. 2**

• Corrections are to be lined through and initialed. No erroneous notes are to be made illegible.

• Include a sketch or map of the site which can be used to locate photo or sample locations. Note landmarks, indicate north, and if possible include an approximate site. Include as many sketches and maps as necessary.

ELIZABETH COAL GAS SITE #1  
02-9004-37  
TDD MANAGER - R. SETTINO  
LOGBOOK #0585  
MAY 18, 1990

• Record details regarding relevant information obtained during onsite interviews. Include names of persons interviewed, the interest group represented, their address and phone number.

• Record any other relevant information which would be difficult to generate at a later date.

Elizabeth Coal Gas Site #1

02-9004-37 2

TABLE OF CONTENTS

I. OFF-SITE RECONNAISSANCE (5-18-90)

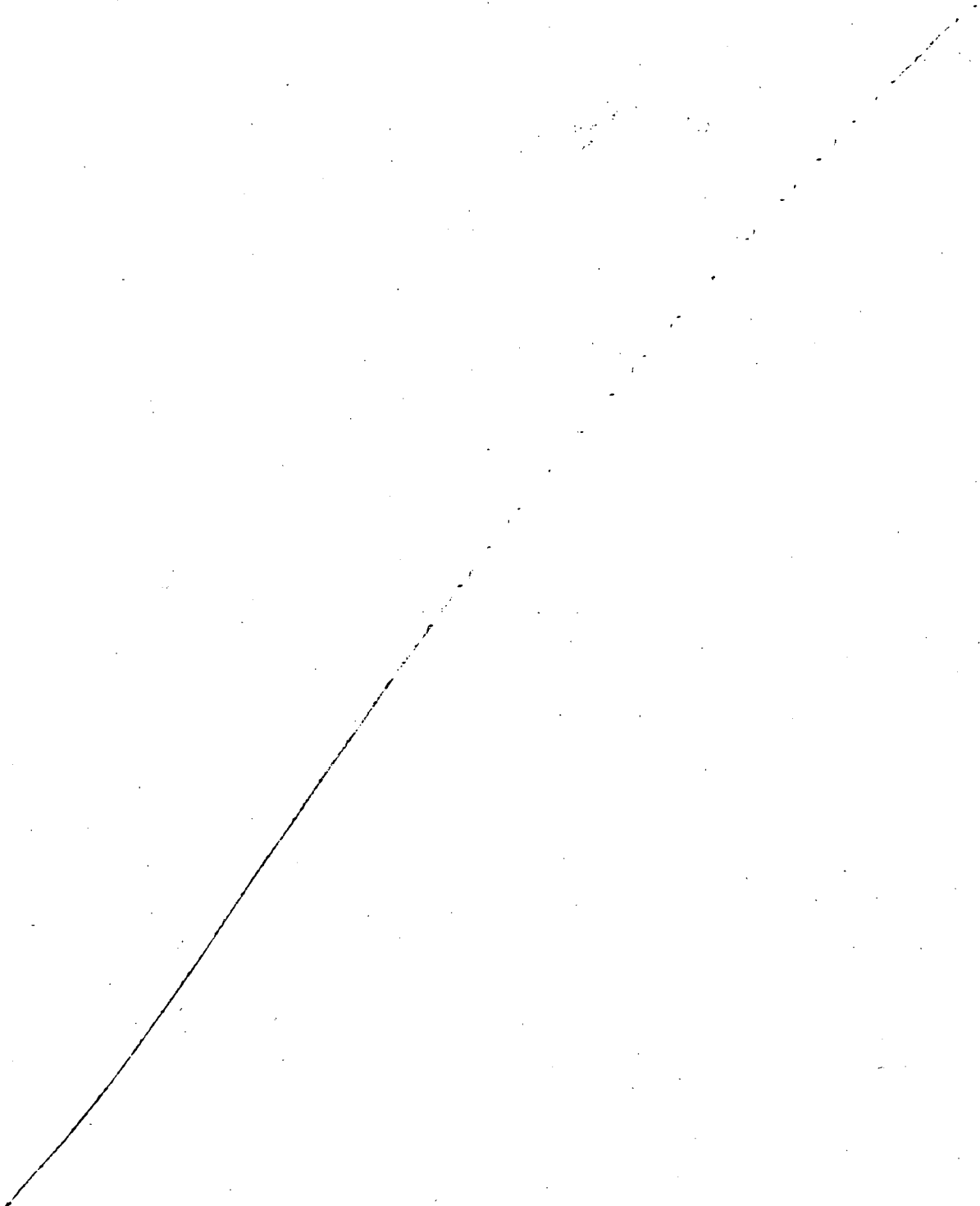
- A) SITE LOCATION p. 4
- B) LOSS REPAIRS p. 4
- C) ARRIVAL TIME p. 4
- D) WEATHER CONDITIONS p. 4
- E) EQUIPMENT LIST p. 4
- F) PHOTO LOG pp 5-6
- G) SITE MAP p. 8
- H) SITE NOTES + OBSERVATIONS pp 8-9
- I) PHOTOGRAPH LOCATION MAP p. 10

Thomas Garner 6/4/90

Richard P. Cline 5-29-90

Elizabeth Coal Gas Site #1

02-9004-37  
3



110

11

11/16/61

Bob P. H.

5-18-90

Elizabeth Coal Gas Site #1

TDD#  
02-9004-37 4

Elizabeth Coal Gas Site #1  
ERIC St between 3<sup>rd</sup> St. and Florida St.  
Elizabeth, NJ -- Union County

OFF-SITE  
RECONNAISSANCE

<u>NUS Personnel</u>	<u>Task</u>	<u>Initials</u>	<u>Date</u>
RICH SETTING	SITE MANAGER	RS	5-18-90
TOM VARNER	SITE SAFETY OFFICER	TV	5/28/90

All personnel have read and understand the work plan.

ARRIVAL TIME: 1425

WEATHER CONDITIONS: partly cloudy, windy, temp approx. 65°

Winds from Southwest 20-30 mph

EQUIPMENT LIST:

Print Camera # 428510

Slide Camera # 307128

135-200 Film (print + slide)

Compass

Binoculars

Thomas Varner 6/4/90

5-21-90  
Richard M. Setters



Elizabeth Coal Gas Site #1

02-9004-37 5

PHOTO RECONNAISSANCE -- 5-18-90

DATE	TIME	ROLL	PICTURE/ SLIDE #	DESCRIPTION	PHOTOGRAPHER
5-18-90	1426	1	P13/\$13	panoramic view of site from Delaware St + 3 <sup>rd</sup> Ave looking northwest to east	T. Varner
5-18-90	1426	1	P14/\$14	panoramic view of site from Delaware St. - 3 <sup>rd</sup> Ave looking northwest to east	T. Varner
5-18-90	1426	1	P15/\$15	panoramic view of site from Delaware St. + 3 <sup>rd</sup> Ave looking northwest to east	T. Varner
5-18-90	1426	1	P16/\$16	panoramic view of site from Delaware St + 3 <sup>rd</sup> Ave looking northwest to east	T. Varner
5-18-90	426	1	P17/\$17	panoramic view of site from Delaware St and 3 <sup>rd</sup> Ave looking northwest to east	T. Varner
5-18-90	1434	1	P18/\$18	photo looking west down Billings' Blvd.	T. Varner
5-18-90	1434	1	P19/\$19	photo of adjacent property looking southeast to west	T. Varner
5-18-90	1434	1	P 200/\$200	photo of adjacent property looking southeast to west	T. Varner

AD

Varner 6/4/90

Richard H. Estess 5-21-90

5-18-90

Elizabeth Coal Gas Site #1

CD-9004-37

6

DATE	TIME	ROLL	PICTURE/ SLIDE #	DESCRIPTION	PHOTOGRAPHER
5-18-90	1434	1	721/721	photo of adjacent property looking southeast to west	T. Vanner
5-18-90	1434	1	722/722	photo of adjacent property looking southwest to west.	T. Vanner
5-18-90	1439	1	723/723	photo from end of Billings Island looking northwest.	T. Vanner

Ref. [unclear] 5-21-90

High Tension Lines  
above ground propane tanks

ELIZABETH RIVER

N.J. TURNPIKE

COURT

1 wooden table

tank car

NORTH

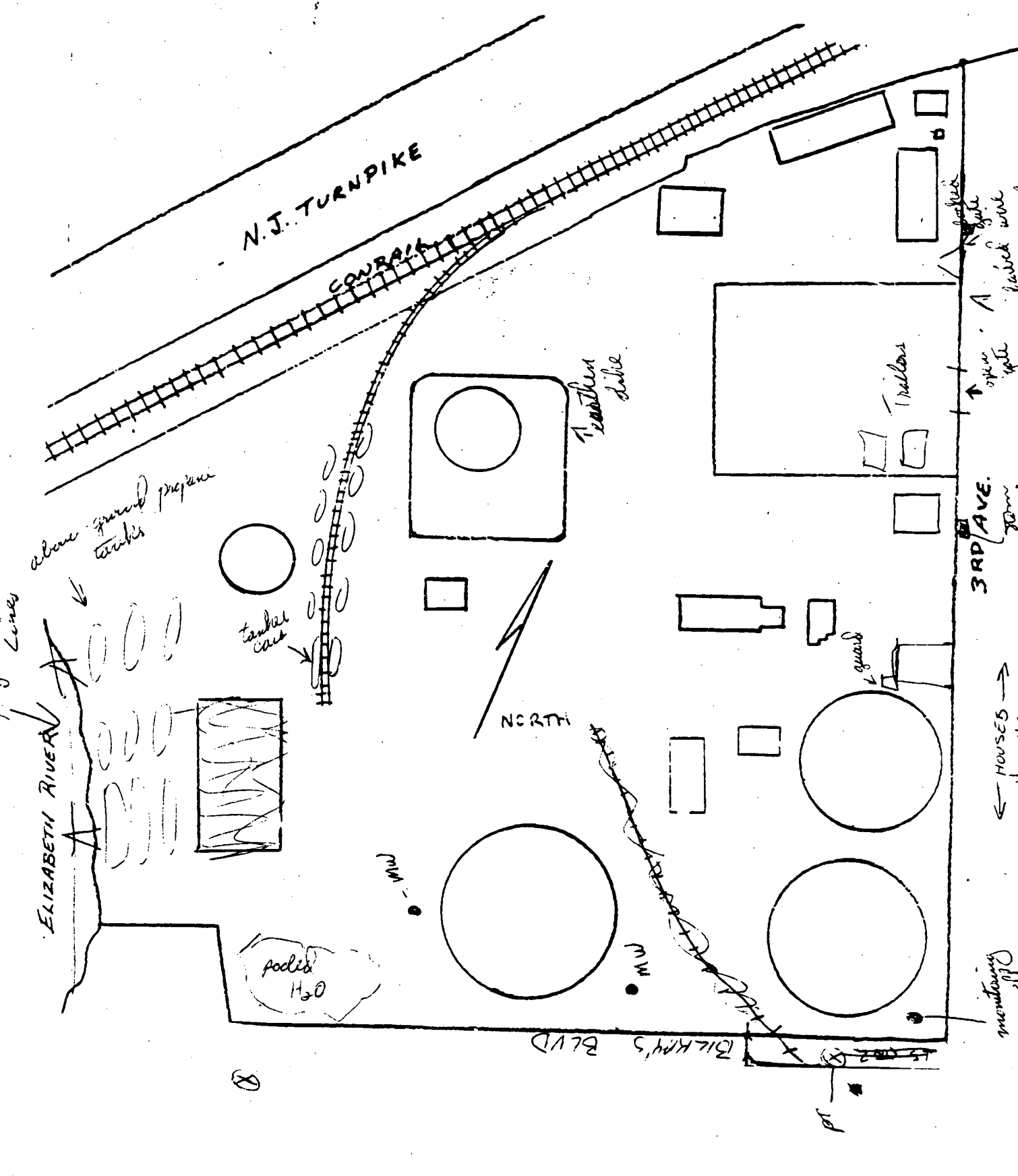
pooled H<sub>2</sub>O

Trailers

3RD AVE.

HOUSES

mountain



5-18-90 Elizabeth Coal Gas Site #1

02-9004-37 8

1426: arrived at Delaware St.

Tom took pictures 13-17 looking northwest to east from intersection of Delaware St and 3<sup>rd</sup> Ave to give panoramic view of site

1434: Tom took p 18 looking west down Belkay's Blvd and p 19-22 looking southeast to west of ~~part~~ ~~of~~ ~~original~~ of adjacent property

Noticed 3 monitoring wells on site

1439: p 23 facing northwest from end of Belkay's Blvd.  
Belkay's

Various debris scattered around site (old pipes, etc.)  
no visible signs of waste or contamination  
site is still active  
across 3<sup>rd</sup> Ave from site is a residential area  
site ~~is~~ <sup>is a</sup> little pond or covered with gravel  
tank in center of facility has approx. 15 foot earthen dike surrounding it

1441: noted small pool of water along Belkay's Blvd under what appears to be a pumping apparatus  
two rows of tanker cars are present in center of site;  
it cannot be seen if the railroad spur is connected to the conrail tracks

1.2

1)

1 hds.

Richard W. ~~Attene~~ 5-21-90

5-18-90 Elizabeth Coal Gas Site #1

CD-9004-37

9

1443: The ~~site~~<sup>is</sup> is much higher than the Elizabeth River.

The ~~is~~<sup>is</sup> embankment wall between the ~~site~~<sup>SITE</sup> and the river built by the Corps of Engineers mentioned in the NIEP information request could not be seen.

The area is relatively flat

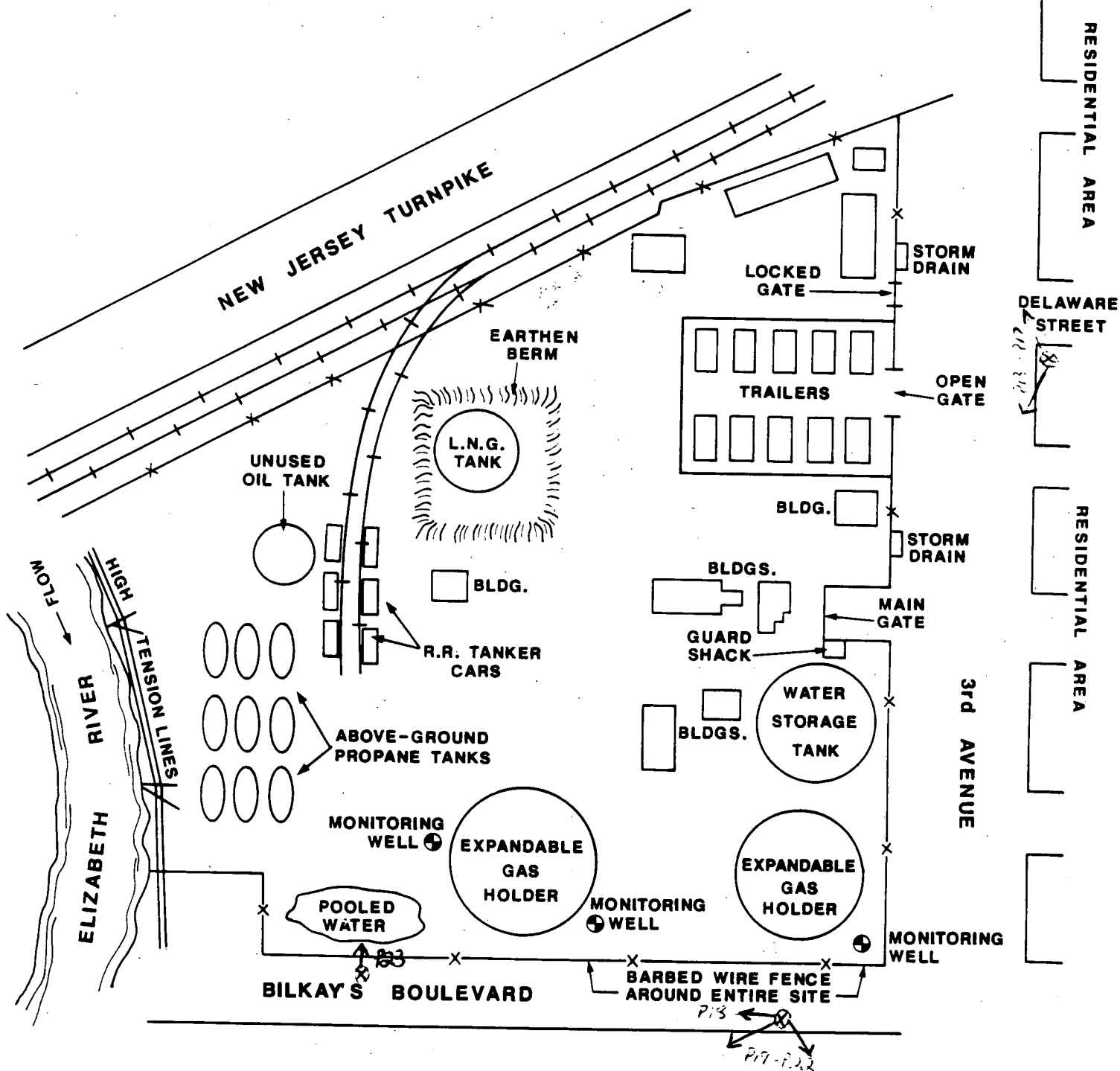
No apparent biota contamination is observed.

Noted a number of above-ground tanks toward rear of site

1450: Left site.

(\*) Note: It should be noted when a picture was taken, a slide with corresponding number was taken at the same spot.

Thomas James 6/4/90 Gephed H. Thomas 5-21-90



⊗ = PROPOSED LOCATIONS

### SITE MAP

ELIZABETH COAL GAS SITE #1, ELIZABETH, N.J.

NOT TO SCALE

FIGURE 2



*Thomas Janner 6/4/90*

*Richard M. Feltner 6-4-90*

**REFERENCE NO. 3**

**NUS CORPORATION  
SUPERFUND DIVISION**

**PROJECT NOTES**

TO: File

DATE: 5-24-90

FROM: RICH SETTINO

COPIES:

SUBJECT: Aerial Photos of Elizabeth Coal Gas Site #1

REFERENCE: ELIZABETH Coal Gas Site #1 TDD No. 02-9004-37

Aerial Photos of the site were obtained to determine site boundaries and also to gain information about site history. Photos were obtained for the following years from the following companies:

- APRIL 28, 1940 -- Western Atlas International Aero Service, <sup>Houston, TX</sup>
- APRIL 16, 1959 -- Robinson Aerial Surveys, Inc., Newton, NJ
- December 4, 1966 -- Robinson Aerial Surveys, Inc., Newton, NJ
- 1969-1970 -- Union County Planning Commission, Union, NJ
- SPRING 1980 -- Union County Planning Commission, Union, NJ

The following observations were made from the photos:

- ① Coal piles were apparently stored on the ground in the center of the site.
- ② A berm was noted to exist around the tank reported to be an oil tank in the rear of the site as far back as 1940.
- ③ An additional expandable gas holder was added to the site sometime between 1940 and 1959.
- ④ The site is not very clear on the 1980 photo.
- ⑤ The LNG Tank + berm and the railroad spur were added to the site sometime between 1969-1970 and 1980. When this was done, two smaller tanks located along the existing railroad tracks to the northwest were removed.
- ⑥ No apparent wastes are present on any of the photos. (cont.)



TO:

File

DATE:

5-24-90

FROM:

RICH SETTINO

CORRESP:

Page 2

SUBJECT:

Aerial Photos of Elizabeth Coal Gas Site #1

REFERENCE:

TDD No. 02-9004-37

- ⑦ Two smaller tanks of unknown size, capacity, or use were noted along the 3<sup>rd</sup> Ave. border of the site. The smaller of the two was removed before 1959. The other tank appears to have been removed between 1969-70 and 1980.

**REFERENCE NO. 4**

# GEOLOGY AND GROUND-WATER RESOURCES OF UNION COUNTY, NEW JERSEY

By Bronius Nemickas

U.S. GEOLOGICAL SURVEY

Water-Resources Investigations 76-73

Prepared in cooperation with

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL  
PROTECTION, DIVISION OF WATER RESOURCES



June 1976

### Methods of this Investigation

An inventory was made of public, industrial and domestic wells tapping the Brunswick Formation, Watchung Basalt and Pleistocene deposits. The well records are presented in Table 4 and well locations are shown in figure 2.

Geologic information was obtained from drillers' well logs and representative well logs are given in Table 6. A bedrock map on top of the Brunswick Formation and Watchung Basalt was constructed from well log information and is shown in figure 2. The thickness of the Pleistocene deposits can be determined from figure 2 by subtracting the bedrock elevation from the surface elevation.

Chemical analyses of ground water were made to identify the characteristic chemical and physical properties of the ground water in Union County. The chemical analyses of water samples from 59 wells are presented in Table 5 and their location is shown on figure 2.

### Acknowledgments

The author wishes to thank well drillers, State, municipal, and industrial officials, and private individuals who supplied data on which this report is based. Acknowledgment is made for the records and logs of wells that were furnished from the files of the New Jersey Bureau of Geology and Topography and to Elizabethtown Water Company for making the water quality analysis available to the author. The cooperation of many individuals who permitted the use of their wells for water-level observation and collection of water samples is gratefully acknowledged.

## GEOGRAPHY

### Topography and Drainage

Union County is in the Piedmont Plateau, one of eight major physiographic divisions of the United States. The major topographic features of the Piedmont Plateau in Union County are: (1) the Watchung Mountains, two basaltic ridges with maximum altitudes of about 550 feet, trending parallel to the northwestern boundary of the county; and (2) a gently rolling plain sloping from about 100 to 150 feet at the eastern side of the Watchung Mountains to sea level at Arthur Kill.

The Watchung Mountains extend from Passaic County through Essex and Union Counties and terminate in Somerset County. The ridges are underlain by thick sheets of basaltic lava flows intercalated with the shales and sandstones of the Newark Group. These ridges trend generally northeast-southwest and have steep, rock escarpments on the east and gentle slopes on the west.

The rolling plain is broken by two topographic features. A broad irregular ridge with maximum altitudes of about 200 feet, an end moraine of the Wisconsin Glaciation, traverses the western edge of the plain area of the county in a roughly north-south direction. This ridge extends from Summit southward to Fanwood to just east of Plainfield (fig. 3). A second end moraine forms a broad low ridge trending roughly east-west in the area of Hillside and Union Townships and in Kenilworth Borough.

Union County lies within five major drainage basins (fig. 4). The western part of the county is drained by the Passaic River and by Green Brook which is within the Raritan River basin. The central part of the county is largely within the Rahway River basin. The eastern part of the county is within the Elizabeth River basin and the Arthur Kill basin.

### Climate

The climate of Union County is largely continental with winds coming predominantly from the interior of North America. The summers are controlled by tropical air masses and the winter by polar continental air masses. From October to April the prevailing winds are from the northwest and from May to September the prevailing winds are from the southwest.

Union County has humid, warm summers, and moderately cold winters. Climatological data has been collected at Elizabeth by the U.S. Weather Bureau since 1894. Average annual precipitation is about 48 inches and the annual average temperature is 53°F. The average growing season or frost-free period is 187 days, from April 19 to October 23.

### Population and Economy

The population of Union County as of the 1960 census is 504,255. The county is ranked fourth largest in population and second smallest in land area in the state. The population density as of the 1960 census was 4,910 per square mile. It is exceeded in population density only by Hudson and Essex Counties.

There are 21 municipalities in the county of which 8 are townships, 7 are boroughs, 5 are cities, and 1 is a town.

The economy of Union County is primarily industrial. The principal industrial products and the number of establishments are listed below:

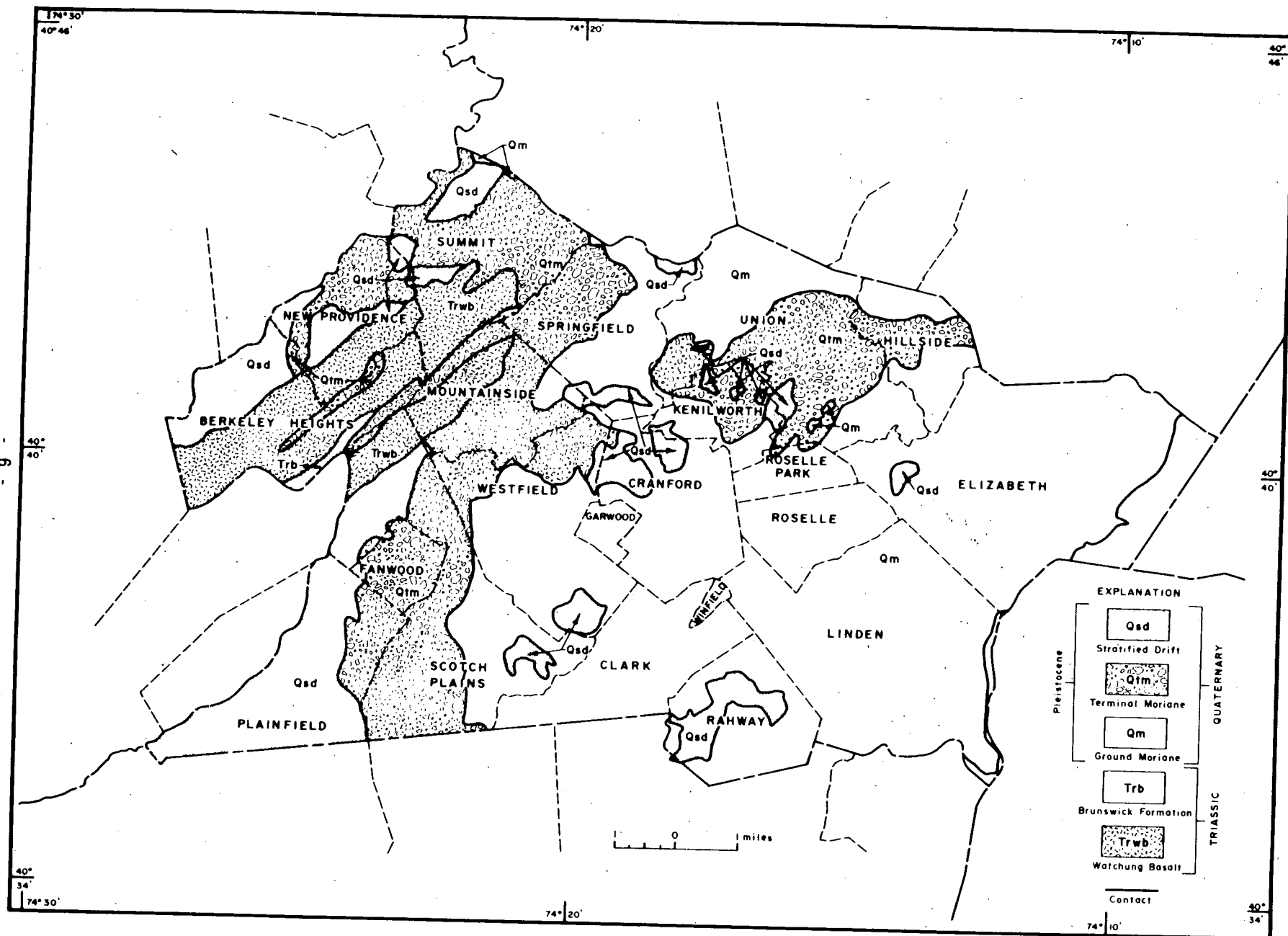


FIGURE 3.--GENERALIZED SURFICIAL GEOLOGIC MAP OF UNION COUNTY, NEW JERSEY.

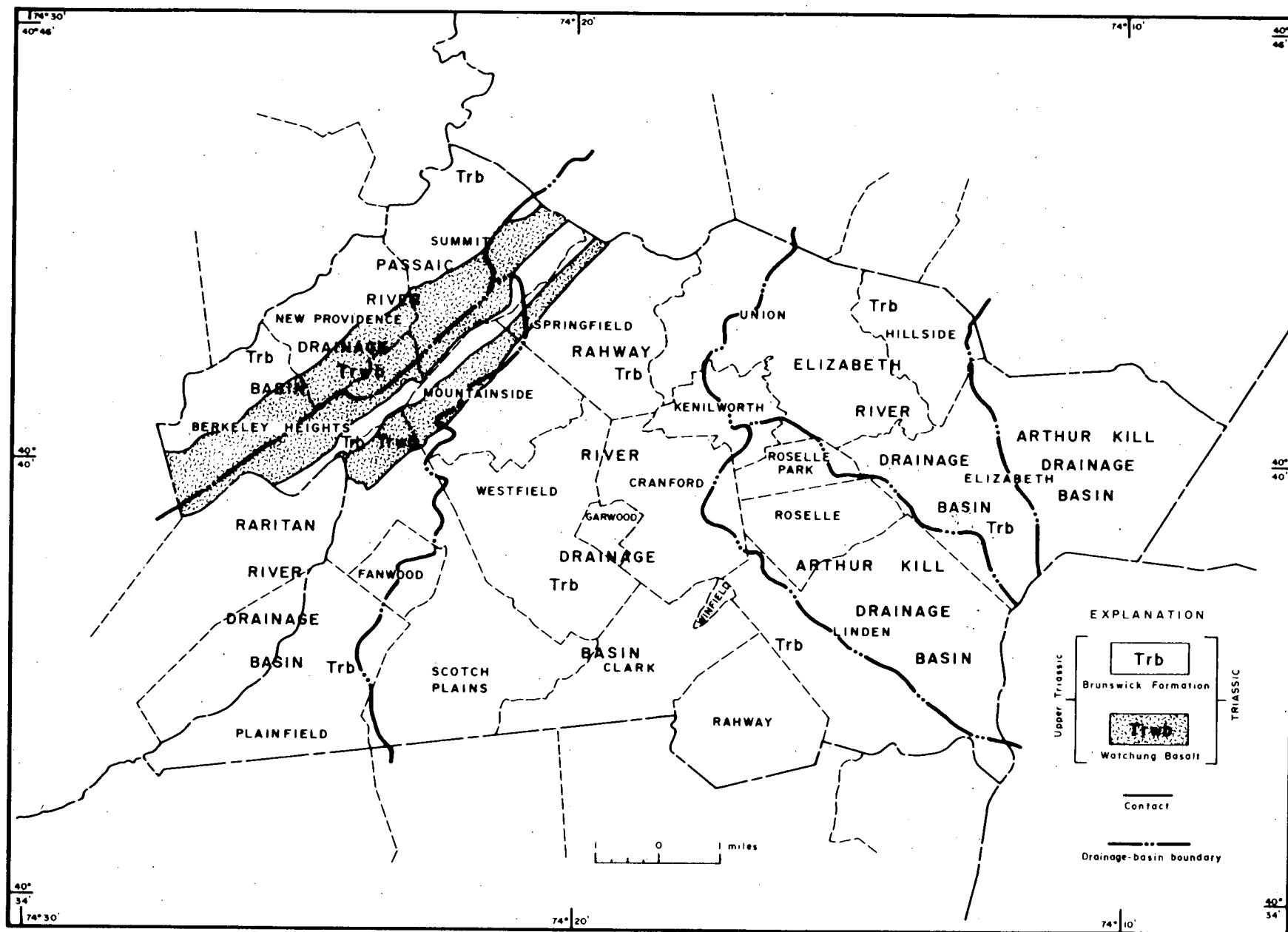


FIGURE 4.--GENERALIZED MAP SHOWING BEDROCK GEOLOGY AND DRAINAGE BASINS OF UNION COUNTY, NEW JERSEY.

<u>Industrial Products</u>	<u>Number of Establishments</u>
Chemicals and allied products	104
Fabricated metal products	226
Machinery, except electrical	275
Food and kindred products	71
Miscellaneous manufacturing	77
Printing and publishing	113
Furniture and fixtures	34
Instruments and related products	25
Textile mill products	14
Stone, clay, and glass products	26
Rubber and plastics products	63
<u>Total</u>	<u>1,424</u>

(New Jersey Department of Environmental Protection, 1967)

## GEOLOGY

### Newark Group

During the Late Triassic Epoch downfaulting produced a series of northeast-southwest trending basins in the Piedmont Plateau from Nova Scotia to North Carolina. Sedimentary and associated igneous rocks of Triassic age occupy the downfaulted basins and are known as the Newark Group. In New Jersey the Newark Group crops out in a band 16 to 30 miles wide trending northeast-southwest from the Delaware River to the Hudson River (fig. 1). Union County lies entirely within this band.

The Newark Group in New Jersey contains 15,000 to 20,000 feet of non-marine shales, mudstones, sandstones, conglomerates, and basic igneous rocks that unconformably overlie rocks of Paleozoic and Precambrian age. The sedimentary rocks of the Newark Group were largely derived from Paleozoic and Precambrian rocks to the southeast and deposited in a non-marine intermontane basin (Van Houten, 1965). During Triassic time the sedimentary rocks were intruded by a diabase sill, dikes, and covered by several flows of basalt.

The Newark Group underlying Union County consists of the Brunswick Formation and Watchung Basalt. The generalized geologic map (fig. 4) shows the areal distribution of the Triassic rocks underlying Union County. Figure 5 is a generalized section showing the geology and structure of Union County.



The Brunswick Formation consists of thin-bedded shales, mudstones, and sandstones which range in color from reddish-brown to gray. The reddish-brown color originates from reworked hematite which comprises 5 to 10 percent of the formation (Boch, 1959). The minerals of the Brunswick Formation include quartz, illite, muscovite, feldspar, and small amounts of calcite and gypsum. Primary structures such as ripple marks and mud cracks indicate that the Brunswick Formation was deposited in a shallow-water environment.

The regional strike of the Brunswick Formation in Union County is N50°E with dips 9° to 13°NW. The major joint sets strike approximately N45°E and N75°W and both sets have a vertical dip. The thickness of the formation is 6,000 to 8,000 feet.

The Watchung Basalt consists of three extensive basaltic lava sheets that are intercalated with the sedimentary rocks of the Brunswick Formation. The basalt flows are more resistant to erosion than the shales, mudstones, and sandstones and form prominent ridges. Two of the three lava sheets occur in Union County and form the First and Second Watchung Mountains. The third sheet forms a discontinuous ridge known as Long Hill and Hook Mountain in Morris County to the west of Union County.

The basalt flows are volcanic extrusive rocks which were formed by the outflow of lava onto the land surface. Rapid cooling of the flows produced a dense, aphanitic rock. Phenocrysts are present in the ground mass which give the basalt a porphyritic texture. The phenocrysts are usually augite and in some cases feldspar. The ground mass for the most part consists of augite and feldspar.

The basalt sheets vary in thickness from less than 300 feet in parts of the Long Hill flow to a maximum of about 1,200 feet in parts of the Second Watchung Mountain. The Second Watchung Mountain is a double flow sheet separated by a thin section of the Brunswick Formation. The thickest flow sheet is the upper flow of the Second Watchung Mountain which has a maximum thickness of about 800 feet.

#### Quaternary Deposits

Unconsolidated sediments deposited by glaciers or by glacial melt-water during the Pleistocene Epoch mantle the bedrock surface in Union County. These deposits consist of clay, silt, sand, gravel, and boulders. They are glacial, glaciolacustrine (deposited by glacial meltwater in lakes), or glacial fluvial (deposited by glacial meltwater in streams) in origin.

The Pleistocene sediments fall into three general classes: (1) end moraine--a moraine jointed across the course of a glacier at its farthest advance; (2) ground moraine--the material carried forward in and beneath the ice and finally deposited from its under surface; and (3) stratified

drift--deposits from glacial meltwater exhibiting both sorting and stratification. The stratified drift includes lacustrine (deposited in lakes) and fluviatile (deposited in streams) sands and clays.

Figure 3 is a surficial geologic map of Union County showing the extent of the end moraine, ground moraine, and stratified drift. West of the end moraine near Scotch Plains and Plainfield, stratified drift forms an outwash plain (fig. 3).

Before the last glaciation the rivers draining Union County cut deep valleys into the Brunswick Formation (fig. 2). Subsequently the valleys were filled and buried by glacial material. The thickness of the glacial deposits is controlled largely by the underlying bedrock topography. Figure 6 consists of three sections showing the altitudes of the bedrock valley floor and thickness of Pleistocene deposits in the bedrock valleys. These buried channels underlie parts of Hillside, Union, Springfield, Clark, and Scotch Plains Townships, and the Boroughs of Mountainside, New Providence and Kenilworth and the Cities of Summit and Rahway.

The Pleistocene sediments in the bedrock channels consist of unstratified and stratified clay, silt, sand, and gravel. Only the sand and gravel deposits of the stratified drift will yield large quantities of water to wells.

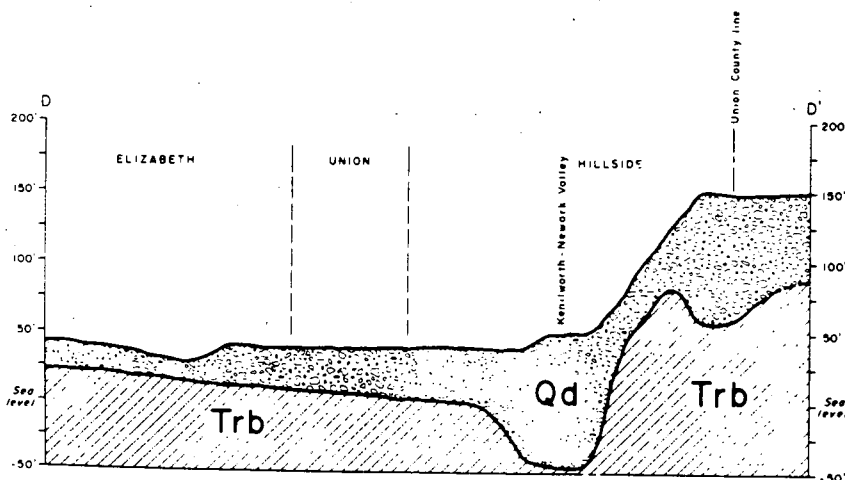
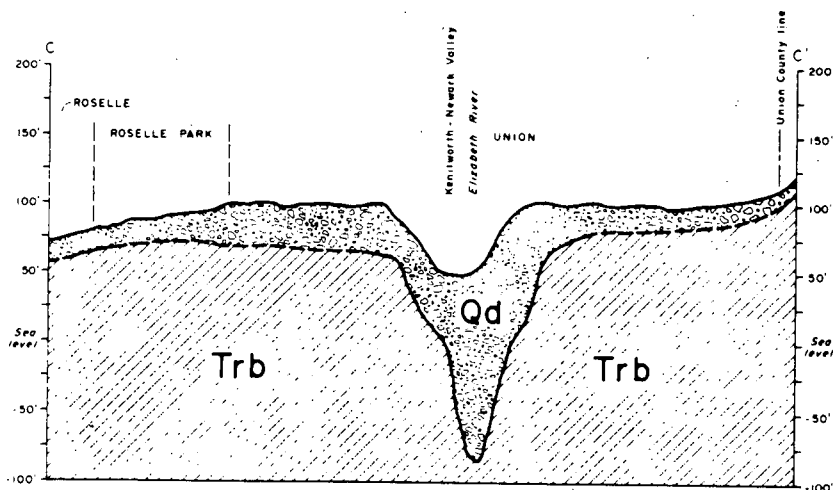
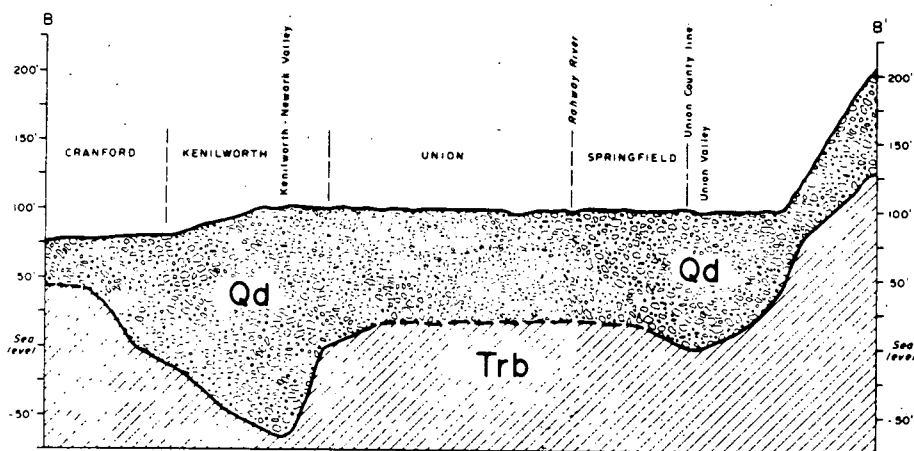
Deposits of Holocene (Recent) age cover only small areas and include river alluvium, and eolian deposits.

The stratigraphic units in Union County and their geologic and hydrologic characteristics are given in Table 1. Table 6 contains representative well logs indicating the variations in the lithologies of the geologic units.

## GROUND WATER HYDROLOGY

### Introduction

Water is continually being exchanged in a circulatory pattern between the earth and the atmosphere. In general, the amount of precipitation ultimately determines the amount of water available for man's use. Some of the precipitation that falls on land evaporates where it falls, some is absorbed by plants that later transpire the water back to the atmosphere, some flows overland to streams, and some infiltrates into the ground to become ground water. The ground water is discharged to streams, and streams flow to the oceans where the water can be evaporated back to the atmosphere.



1/2 0 1 MILE  
Vertical exaggeration X 40

Location of cross sections shown on figures 3 and 4

EXPLANATION

- QUATERNARY  
Glacial Drift
- TRIASSIC  
Brunswick Formation

FIGURE 6.--GEOLOGIC SECTIONS SHOWING THE BURIED CHANNELS IN UNION COUNTY, NEW JERSEY.

Table 1.--Geology and hydrology of the rock units in Union County, New Jersey

Era	Period	Series	Formation or lithologic unit	Thickness (feet)	Lithology	Hydrologic characteristics
Cenozoic	Quaternary	Holocene	alluvium	0-25	Sand, silt, and mud in and along river channels.	Relatively impermeable deposits; retard intrusion of saline water through river beds.
			aeolian deposits	0-10	Sand	Above water table; high rate of infiltration.
		Pleistocene	un-stratified drift (till)	0-200	Unstratified clay, sand and gravel; reddish brown in color. Forms the ground and end moraine deposits. Deposited by glaciers.	Because of low permeability, it is not an important aquifer in the County.
			stratified drift	0-60	Sand and gravel lenses which are stratified. Occurs as lenses in the till in the bedrock channels and interbedded with till in the end moraines. Deposited by water.	Important as an aquifer in the City of Rahway and in Union, Hillside and Springfield Townships and in Kenilworth Borough. At the City of Rahway and Hillside Township wells induce recharge from rivers.
Mesozoic	Triassic	Upper Triassic	Newark Group		Unconformity	
			Brunswick Formation	6,000-8,000	Interbedded, soft red shales, mudstones, and sandstones. Adjacent to the Watchung Basalt it is altered to a hornfels.	Most extensive and most important aquifer in Union County. Water stored in and transmitted along fracture and joint systems which decrease in number and volume with depth. Both artesian and water-table conditions exist.
			Watchung Basalt	300-800	Basaltic lava sheets intercalated with the sedimentary rocks of the Newark Group. Two of the sheets crop out in Union County. The basalt is a dense, aphanitic, extrusive rock. Augite and feldspars are the chief minerals.	Minor aquifer in the county. Well yields are low to moderate.

The specific capacity of a well, the rate of yield per unit drawdown for some time interval, generally gallons per minute per foot of drawdown, can be a good measure of the transmissibility of the rocks. High specific capacities generally suggest a high coefficient of transmissibility, and low specific capacities generally suggest a low coefficient of transmissibility. However, specific capacity also is affected by the coefficient of storage, the thickness and boundary conditions of the aquifer penetrated by the well, and development and construction of the well.

For a more complete discussion of general ground-water hydraulics, the reader is referred to Theis (1935, p. 519-524), Ferris (1949, p. 226-272), Todd (1959, p. 77-114), DeWiest (1965, p. 161-183), and Davis and DeWiest (1966, p. 156-374).

### Water-bearing Properties of Major Rock Units

#### Newark Group

##### Brunswick Formation

The Brunswick Formation of Late Triassic age is the major aquifer in Union County and underlies most of the county. Water in this formation occurs in joints and fractures. These joints and fractures become progressively tighter and fewer with increasing depth below land surface. Only moderate quantities of water can be stored or transmitted in these fractures.

Ground water occurs under both unconfined and confined conditions in the Brunswick Formation. Unconfined ground water occurs mainly in the upland areas where overlying unconsolidated sediments are thin or absent. In the lowland areas in the southern and eastern part of Union County the rocks are mantled by unconsolidated Pleistocene deposits that, in most places, contain silt and clay beds. In the lowland areas the silt and clay beds may confine water in the underlying rocks. Wherever such confinement occurs, water beneath the impermeable layers is under artesian pressure. In a few areas the artesian head is above land surface resulting in flowing wells. Locally, artesian conditions result from differences in permeability within the rock layers caused by varying degrees of fracturing, or weathering, or a combination of both.

Several pumping tests have been conducted on wells tapping the Brunswick Formation in Union County. The coefficient of transmissibility determined from five of these tests ranged from 5,900 to 25,400 gpd per ft; most of the values lie between 15,000 and 25,000 gpd per ft. The average coefficient of storage computed from these tests is about 0.00005.

Results of pumping tests indicate that the Brunswick Formation is anisotropic; that is, its ability to transmit water is not equal in all directions. The greatest drawdowns caused by pumping are observed in wells aligned along the strike of the beds with respect to the pumping well. The smallest drawdowns are observed in wells aligned transverse to the strike (Vecchioli, 1967). These pumping test observations have been interpreted to indicate that joints and fractures which strike parallel to the strike of the bedding are better developed and interconnected than joints and fractures which strike in other directions. Therefore, minimum interference between pumping wells in well fields tapping the Brunswick Formation can be achieved by aligning the wells across the strike of the beds rather than parallel to the strike.

The average reported yield of 230 public-supply, industrial, and commercial wells (table 4) tapping the Brunswick Formation is 200 gpm; yields range from 12 to 870 gpm. A better indication of the potential yield of properly located and developed wells tapping the Brunswick Formation can be obtained from analysis of yields of large diameter (10 inch or greater) wells. The large diameter wells, generally the deeper wells, represent attempts to develop the maximum supply of water. The average yield of 109 large diameter wells (table 4) is 310 gpm; yields range from 23 to 870 gpm.

The distribution of well yields is as follows:

<u>Yield (gpm)</u>	<u>230 Wells</u>	<u>109 Large Diameter Wells</u>
0 - 50	18	2
51 - 100	42	9
101 - 150	36	8
151 - 200	32	14
201 - 250	25	10
251 - 300	20	13
301 - 350	16	15
351 - 400	10	7
401 - 450	6	6
451 - 500	9	9
501 - 550	10	10
551 - 600	2	2
600	4	4

Figure 9 shows the cumulative frequency distribution of reported yields of wells in the Brunswick Formation. It can be seen on the graph that 50 percent of the 230 wells have yields equal to or less than 180 gpm; 50 percent of the large diameter wells have yields equal to or less than 300 gpm. Many of the higher yielding wells occur where the Brunswick Formation is overlain by relatively thick, saturated glacial deposits that readily pass water downward into the fractures in the Brunswick Formation.

The specific capacities of 205 wells (6 to 12 inches in diameter) in the Brunswick Formation range from 0.04 to 25 and average 3.5 gpm per foot of drawdown; 14 of the wells have specific capacities greater than 10 gpm per foot of drawdown. The depths of the wells range from 100 to 1,108 feet and average 387 feet.

Figure 10 is a cumulative frequency distribution graph of specific capacities of wells tapping the Brunswick Formation in Union County. In figure 10, specific capacities are related to the well diameter. The larger diameter wells have the higher specific capacities. Median specific capacities are 1.7 for 6 and 8-inch diameter wells, 2.0 for 10 inch diameter wells and 3.1 for 12 inch and larger diameter wells. The higher specific capacities in the larger diameter wells can be attributed to better well development, well site selection and decreased well entrance losses.

In table 2, specific capacities are listed in percentile on the basis of depth of well drilled below land surface. In order to minimize the effect of well diameter on specific capacity, separate listings for larger and smaller diameter wells are given. Wells between 200 and 600 feet deep, in general have higher specific capacities than wells of shallower or greater depths. This relationship suggests that the best water-producing zones in the Brunswick Formation are encountered between depths of 200 and 600 feet. Below 600 feet the fractures and joints are less enlarged and generally drilling to greater depths will not produce significantly greater well yields.

Wells tapping the Brunswick Formation generally draw water from several water-bearing zones. In areas where the rocks are exposed or covered by a thin layer of unconsolidated sediments the shallow water-bearing zones contain unconfined water to a depth of about 200 or 300 feet. If wells penetrate to depths between 200 and 600 feet one or more confined zones of greater permeability are intercepted. The wells that are drilled between 200 to 600 feet in general have the greatest yields.

#### Watchung Basalt

The Watchung Basalt is a minor aquifer and underlies the western edge of Union County. In this formation vesicles add primary porosity to the secondary porosity developed from the joints and fractures. However, all these openings constitute only a small part of the total volume of the basalt and their capacity to store and transmit water is poor.

**REFERENCE NO. 5**



# The New Jersey Ground-Water Situation by David W. Miller

August 4, 1979 (see telecon note - 02-880332-SI  
~~02-880332-SI~~ 5/1/81)

GERAGHTY & MILLER, INC.  
Groundwater  
Consultants

HACKENSACK, NEW JERSEY  
7 Atlantic Street  
Hackensack, New Jersey 07601  
(201) 646-1400

SYOSSET, NEW YORK  
North Shore Atrium  
6800 Jericho Turnpike  
Syosset, New York 11791  
(516) 921-6060

## THE ACQUIRED SYSTEMS

For a general discussion of ground-water conditions in New Jersey, the state can be divided into three broad geographic areas based on the distinctive rock types that occur in each (Figure 1). The Coastal Plain physiographic province is the largest area, and encompasses more than 5,000 square miles in the southern portion of the state. The geology of the Coastal Plain is characterized by a southeasterly dipping and thickening sequence of unconsolidated sediments.

The Triassic Lowlands are underlain by thousands of feet of red shale, with some sandstone, siltstone, conglomerate, basalt and diabase. The geologic formations in the Highlands region consist of hard crystalline rocks such as the Precambrian gneisses and quartzites; carbonates, such as the Kittatinny limestone; and relatively dense sandstones, conglomerates and shales, such as the Martinsburg.

→ Bedrock in both the Triassic Lowlands and the Highlands is overlain by unconsolidated deposits of glacial origin. In places, these surficial deposits are thick and permeable, and are commonly in direct hydraulic connection with the underlying bedrock and adjacent streams, rivers, and lakes.

-13-

## THE TRIASSIC LOWLANDS AND THE HIGHLANDS REGION OF NORTHERN NEW JERSEY

The geology and hydrology of northern New Jersey are considerably more complex than the Coastal Plain region. To simplify, it has been divided into two broad areas, the Triassic Lowlands and the Highlands Region (Figure 1). Unlike the Coastal Plain, where the aquifers consist of extensive beds of unconsolidated deposits, the primary water-bearing units in northern New Jersey are sedimentary and crystalline rocks (Figure 11). These vary considerably in their ability to yield water, depending on rock type and location. Both regions are also heavily dependent upon unconsolidated glacial deposits for water supply and where these occur in buried, eroded rock channels and are thick and permeable, the glacial sediments represent the most important source of ground water in both the Triassic Lowlands and the Highlands. Figure 12 shows the general major deposits of glacial origin that may have some ground-water potential.

### Geology and Hydrology

Triassic Sediments: The Triassic Lowlands are almost entirely underlain by sedimentary Brunswick Shale. Although its primary permeability is low, appreciable amounts of water are found in joints and fractures. However, unless a significant number of these joints and fractures are penetrated by a well, yields can be relatively small. The direction of highest permeability and of the greatest movement of water in response to pumping tends to parallel the strike of the beds, generally southwest to northeast.

Glacial Sediments: Unconsolidated deposits overlying rock in northern New Jersey consist generally of till, clay, or stratified drift. These deposits are thickest in the valleys and thin or absent in upland areas. Permeable sands and gravels contained within the valley fill sediments that are suitable for ground-water development range in thickness from 50 to several hundred feet. Individual beds that can support high capacity wells are not extensive, and lithology may change radically over as little as 100 feet within the same valley. Well yields commonly reported for the glacial sediments represent successful wells located from a program of test drilling and pumping.

Although the rock aquifers have been mapped in some detail throughout both the Triassic Lowlands and the Highlands Region, the areal extent of important glacial aquifers is relatively unknown except in some of the more heavily developed areas of eastern Morris and western Essex Counties, Union County, the Ramapo River subbasin, and the Rockaway River subbasin (Figure 12).

Public supply and industrial wells tapping the more permeable stratified drift are almost uniformly capable of producing several hundred thousand gpd to more than one mgd. For example, yields of wells completed in Union County in 50 to 200 feet of sand and gravel sediments in Kenilworth-Newark Valley, Summit Valley, Union Valley, and Rahway Valley, average approximately 400 gpm. Wells in Essex and Morris Counties tapping glacial sands and gravels adjacent to the Passaic River and its tributaries produce one to 1.5 mgd. Total pumpage from the system of buried valleys in this latter area is about 20 mgd, with the highest yields from formations receiving recharge from adjacent streams.

-10-

Somerset County: Surface- and ground-water resources are both utilized to meet constantly increasing requirements. Surface supplies are primarily obtained from the Neshanic, Raritan, and North Branch Rivers in the west, the Millstone River in the southeast, and the Raritan River in central Somerset. A County Planning Board study has estimated that surface water will eventually supply 80 percent of the county's total public water system demands. Supplies for areas removed from major population centers will continue to be provided by ground-water.

The maximum potential yield of the aquifers in Somerset County has not been quantified. However, there have been no major supply or quality problems reported and additional ground-water development appears feasible.

Sussex County: An inventory of the major public utility systems in Sussex County indicates that 14 percent use surface water, 67 percent rely on wells, and the remaining 19 percent use both. Surface systems, predominant in and around the larger towns and boroughs, draw much of their supply from the Delaware, Paulins Kill, and Wallkill Rivers. Rural areas generally depend upon domestic wells.

An evaluation of industrial and public supply pumpage, which is scattered throughout the south-southeastern portion of Sussex County, and the area's general recharge patterns indicates that the consolidated rock aquifers are not being utilized to their maximum potential.

Union County: Public supply from ground-water sources is derived principally from the Triassic shales. The only pumpage from unconsolidated

sediments is in the southern and extreme northern parts of the county.

Analysis of regional recharge indicates that there may be serious problems of overpumping. Union County is almost entirely sewered, and virtually all usage is consumptive. Specific case histories of water-level declines do not exist in the literature, and the water-level monitoring system in the county cannot identify problems if they do exist. However, present pumpage appears to exceed maximum potential yield.

Warren County: Surface supplies are primarily obtained from the Pauls Kill River in north central Warren and the Musconetcong and Delaware Rivers which form the southeastern and northwestern boundaries of the county. In rural areas, where surface water has not been developed, domestic wells are the principal source of supply.

#### Ground-Water Quality

The water in the sedimentary rock aquifers of the Triassic Lowlands generally ranges from slightly acidic to slightly alkaline (pH 6.3 to 8.5). The quality is quite variable and is generally much more mineralized than in most of the other aquifers. Total dissolved solids generally range from about 100 mg/L (milligrams per liter) to over 500 mg/L. In most instances, water in the rock aquifer is less mineralized in the recharge areas at higher altitudes and more mineralized in discharge areas at low altitudes. This is apparently a function of the distance and travel time of the ground water through mineralized formation materials. The degree of mineralization often becomes greater with increasing depth. Ground water is moder-

Mineralized water is found in stratified drift underlain by Precambrian rocks than in stratified drift underlain by shales and sandstones of the Triassic Lowlands. Where there is pumpage from deposits associated with streams, the water induced from the stream significantly affects the quality of ground water pumped from wells.

Salt-water encroachment has been noted in the Triassic shales of the Newark area where heavy industrial pumpage lowered water levels more than 100 feet. Data on the current status of this problem are not readily available. Saline water is also encountered in some unconsolidated deposits adjacent to estuaries.

#### Summary

Ground water serves as a major municipal, industrial, and domestic source in northern New Jersey. Where surface-water sources are being used to their capacity, even greater dependence will be placed on ground water. However, there are a number of significant constraints on continued development of ground water. In counties such as Bergen, Essex, southern Passaic, Union, and eastern Morris, heavy pumpage of the Brunswick shale and the stratified drift deposits together with consumptive use, has overstressed aquifers on a local basis and limited the availability of new ground-water supplies. In addition, the high degree of urbanization has eliminated many potential sites for new wells and has reduced recharge to the aquifer. In many cases, the large-scale development of particular aquifer areas has undoubtedly resulted in substantial impacts on surface-water sources. Some potential for developing new supplies does exist, but

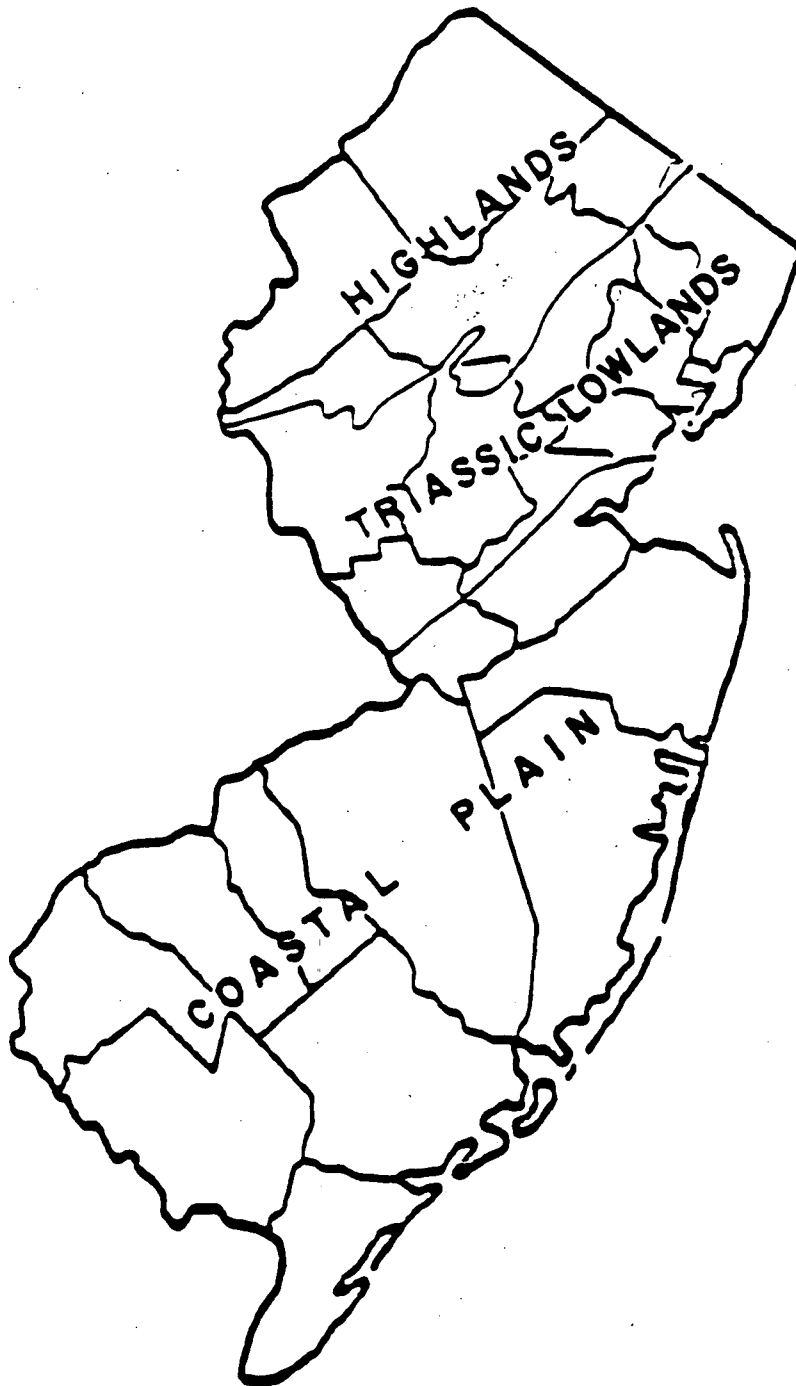


Figure 1 - PRINCIPAL GEOLOGIC REGIONS



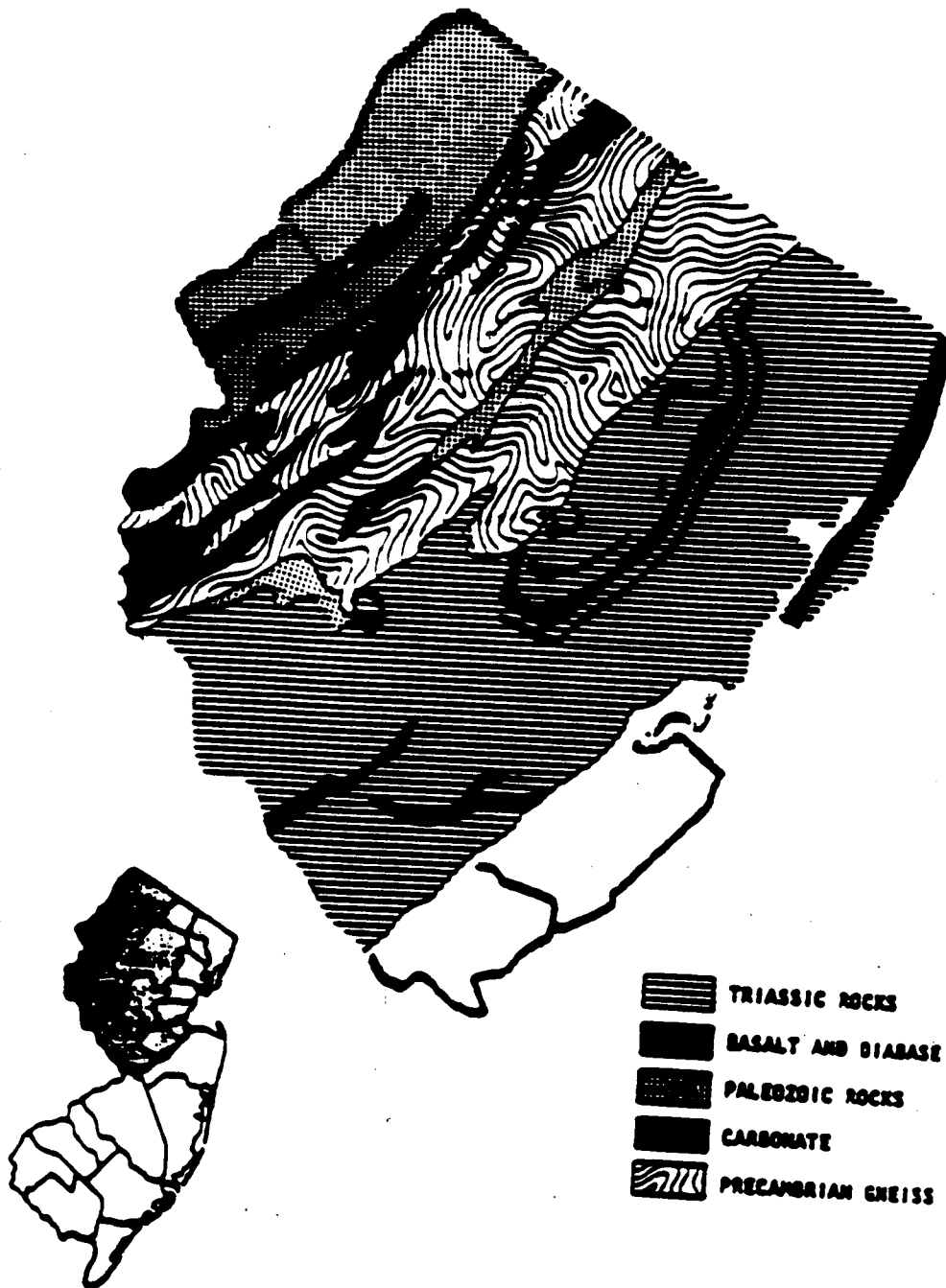


Figure 11 - BEDROCK GEOLOGY IN NORTHERN NEW JERSEY



Figure 12 - POTENTIAL UNCONSOLIDATED AQUIFERS IN  
NORTHERN NEW JERSEY

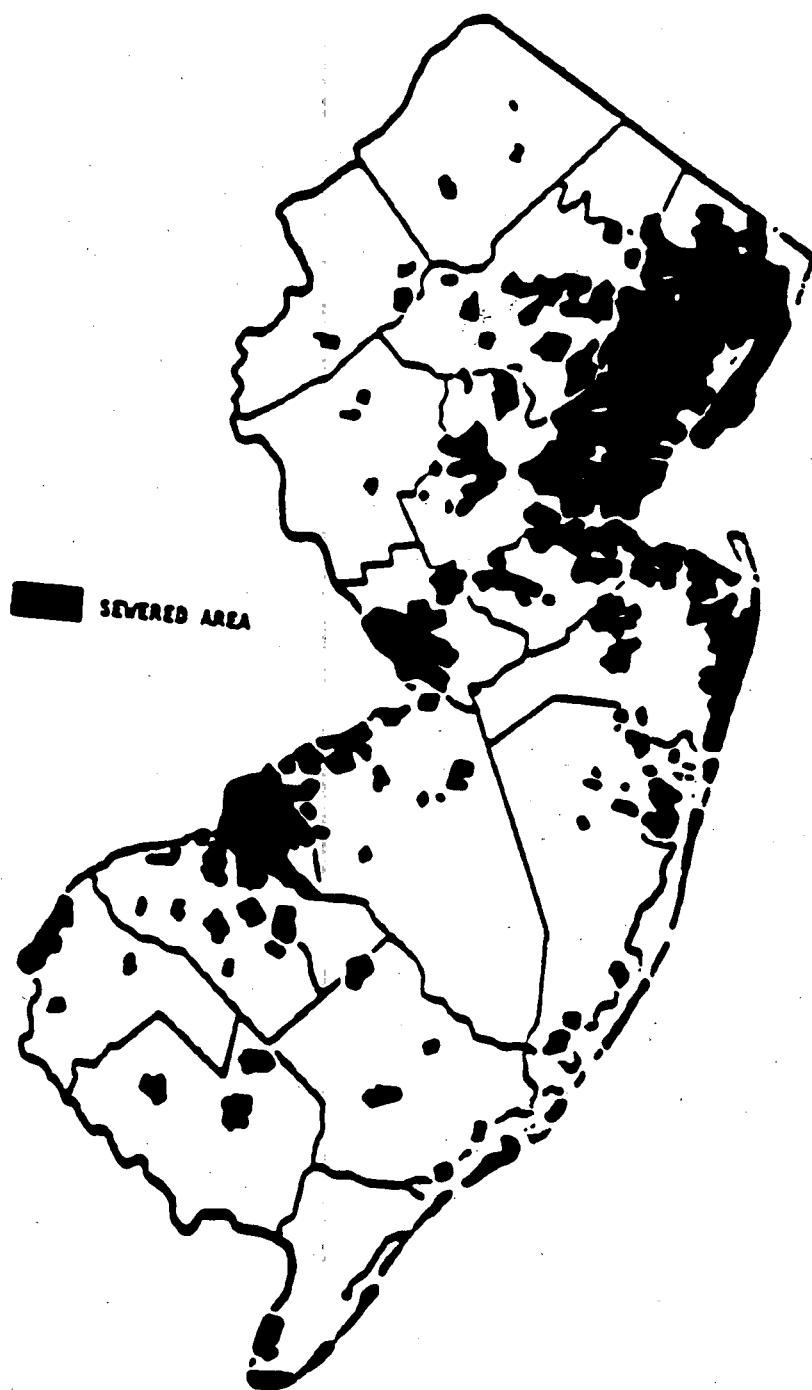


Figure 13 - EXTENT OF SEWERED AND UNSEWERED AREAS

**REFERENCE NO. 6**



**Elizabethtown Gas** COMPANY

A NATIONAL UTILITIES & INDUSTRIES COMPANY

ELIZABETHTOWN PLAZA • ELIZABETH, NEW JERSEY 07207 • (201) 289-5000  
ONE BROWN AVENUE, ISELIN, NEW JERSEY 08830-9990

July 6, 1984

TO: Bob Goodale  
TH: Fu 20 JUL 1984  
Beto 7/20

Dr. Marwan M. Sadat, P.E.  
Director, Division of Waste Management  
Department of Environmental Protection  
32 E. Hanover Street  
CN 028  
Trenton, NJ 08625

Dear Dr. Sadat:

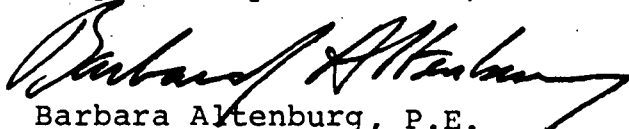
The attached information is provided to you in response to your information request dated February 29, 1984. The response covers six sites; two in **Elizabeth**, and one each in Rahway, Perth Amboy, Flemington and Newton. We have kept the numbering of the questions as they appeared on your original letter.

On-site data only exists for the Erie Street Plant in Elizabeth in the form of soil boring data from studies done for structures which were subsequently installed. This data has been included.

In the section on Ground and Surface Water Use, the questions have been answered to the best of our ability, however, the underlying aquifer in use may be so deep that it may not be an aquifer of concern. Your questions did not address this differentiation of aquifers and aquifers of concern, and we trust your department has the expertise in regional geology to fairly interpret the data provided.

If you have any questions please contact me at 201/289-5000, Ext. 168.

Respectfully submitted,

  
Barbara Altenburg, P.E.  
Project Manager

BJA/bl  
Attach.

gy 15498

FORMER GAS MANUFACTURING PLANTS

SITE: #1, Elizabeth, NJ

LOCATION: 3rd Ave. at Florida St.

SIZE: 25 acres +

PRESENT OWNERSHIP: Elizabethtown Gas Co. since 1857

PRIOR OWNERSHIP:

WELLS: None in vicinity

WATER COURSES: Elizabeth River 160'

HEALTH DEPT.: City of Elizabeth

PRESENT LAND USE: Gas Storage and Transfer, Computer Center.  
Industrial Field Operations Base, Other  
Storage.

ADJACENT LAND USE: 1300' of Residential/Light Industrial Frontage  
1400' ConRail and NJ Turnpike Frontage  
700' Elizabeth River Frontage  
1000' Trucking Terminal

APPROXIMATE DATES OF PLANT OPERATION: 1857-1952  
Used for peak shaving 1952-1971

# NJ DEP INFORMATION REQUEST

## ERIE STREET PLANT

### I. SITE BACKGROUND

1. Location: 3rd Ave. at Florida St., Elizabeth  
Map attached.
2. Site Description:
  - a. See sketch.
  - b. Buildings and tanks are as indicated on sketch in 2.a. The entire property is secured with chain link fence and 24 hour guard. The yard is mostly covered by crushed stone and fill.
3. History of Ownership and Use:
  - a. Elizabethtown Gas Co. has owned the property since 1857. Gas was manufactured until 1952 on a daily basis. From 1952 until 1971 gas was only manufactured on the coldest winter days when it was needed to help meet demand. The manufacturing plant and most of the buildings were removed in 1978. The remaining structures include two large vacant brick buildings which are used for gas mixing and distribution operations (including propane/air and LNG), three buildings which are used for part of the operations function and for the gas dispatching control center, a water pump house for the fire protection system, a water storage tank, two gas holders, a battery of propane storage tanks and a liquified natural gas storage tank, and an unused oil tank.
  - b. Although actual waste handling practices at the plant are largely unknown, areas of the yard were designated for waste storage. Concrete bins were used to separate and store tars and other oils were kept in above ground tanks. In the early days of the plant's operation (prior to 1920's) tars were removed by rail car and sold to asphalt companies and a refinery. Tars were later sold and transported off-site by truck.
  - c. Materials which were not marketable, such as poor quality tars which were recovered from the machinery when it was cleaned and oils which were pumped out of the mains in a mixture of water, were probably deposited on the site. There is evidence of these products in the center of the property where the coal and coke piles were. It was thought that coal and coke would act as a filter on these waste materials.

3. d. Since the material is buried and underlain by a layer of relatively impermeable clay, no remedial action has been taken other than filtration of stormwater run-off.
- e. On April 17, 1984 a citation was issued for a violation of 33USC1161 during the start up test for a new fire protection system at the plant.
4. It is expected that future use of the site will be the same as present use.

## II. SITE CHARACTERISTICS

### A. Land Use:

1. The site is situated in an area with mixed urban/industrial/commercial land use. Northeast of the site, across 3rd Avenue, there is a residential area. To the southeast is a highly industrialized area including a truck terminal and chemical storage yards. ConRail and the Turnpike border the property on the northwest and the Elizabeth River runs southwest of the property. The Arthur Kill is within a mile of the site.
2. The average population density within a 2 mile radius of the plant is approximately 7,000 people per square mile.
3. The site is secured by 8 foot chain link fencing topped with barbed wire. A guard is on duty 24 hours a day and plant personnel monitor a closed circuit television scan of the plant main entrance.

### B. Site Terrain:

1. Average slope of the site is less than 2%. See topographic map.
2. The nearest downslope surface water is the Elizabeth River. At this location there is significant tidal influence on the river. It joins the Arthur Kill within a mile of the site and there is no known use of this body of water for other than shipping.
3. The terrain slopes slightly toward the river, however the Corps of Engineers has built a 12-15 foot high embankment between the river and the site.



4. The site ranges from 6 to 12 feet above sea level. Adjacent properties are at the same general elevations with the exception of the Turnpike and ConRail which are much higher.

C. Ground and Surface Water Use

1. There are no known uses of the aquifer underlying the site within a three mile radius. Our search did not indicate any well records.
2. There are no known potable wells within 3 miles of the site.
3. There are no water-supply wells within 3 miles of the site.
4. Uses of surface water within 3 miles of the site are restricted to shipping.
5. There are no surface water supply intakes within 3 miles downstream of the site.

D. Site Contamination

- a. See boring data.



# PHILIP J. HEALEY COMPANY est. 1870

43 SOUTH AVENUE, FANWOOD, NEW JERSEY 07023

(201) 322-6500

## TEST BORING DATA

Project: Propane Air Facility TEST HOLE NO. 1


Location: Elizabeth, New Jersey Sheet 1 of 1

Boring Contractor: Philip J. Healey Company Surface Elevation:

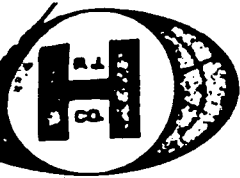
Inspector: Ground water observations

Date Started: 6/10/80 Depth: 4.3' Date: 6/10/80

Date Completed: 6/10/80 Depth: Date:

Depth in Feet	Casing Blows	SAMPLE NO. DEPTH		BLOWS ON SPOON				REC.	SAMPLE IDENTIFICATION AND PROFILE CHANGE	ELEV.
				0	6	12	18			
				6	12	18	24			
5		S-1	0.0 2.0	4	5	5	6		FILL: Yellow mf SAND, s. Clayey Silt, l. f Gravel, tar 	4.3'
										8.0'
10		S-2	5.0 7.0	3	3	4	4		Dark Brn. cf SAND, a. Organic Silt & Clay, t. f Gravel	
										12.0'
15		S-3	10.0 12.0	3	3	4	4		Brn. CLAY & SILT, t. f Sand	
										23.0'
20		S-4	15.0 17.0	9	12	14	15		Refusal	
		S-5	21.0 23.0	31	59	86	150			
25										
30										
35										
40										

I. D. Casing	in	Wgt. Hammer on Casing	lb	Symbol	a.	s.	l.	t.
I. D. Spoon	1-3/8 in	Wgt. Hammer on Spoon	140 lb	Proportions	and	some	little	trace
Type Core Drill		Drop Hammer on Casing	in	% By Wgt.	35 to 50	20 to 35	10 to 20	1 to 10
Core Dia.	in	Drop Hammer on Spoon	30 in					




# PHILIP J. HEALEY COMPANY est. 1870

43 SOUTH AVENUE, FANWOOD, NEW JERSEY 07023

(201) 322-6500

## TEST BORING DATA

Project: Propane Air Facility TEST HOLE NO. 2  
Location: Elizabeth, New Jersey Sheet 1 of 1  
Boring Contractor: Philip J. Healey Company Surface Elevation:  
Inspector: Ground water observations  
Date Started: 6/10/80 Depth: 3.5' Date: 6/10/80  
Date Completed: 6/10/80 Depth: Date:

	Casing Blows	SAMPLE NO. DEPTH		BLOWS ON SPOON				REC.	SAMPLE IDENTIFICATION AND PROFILE CHANGE	ELEV.
				0 6	6 12	12 18	18 24			
		S-1	0.0	2.0	7	10	9	6	FILL: Yellow mf SAND, wood, brick fragments 	
5										3.5'
		S-2	5.0	7.0	6	4	4	5	Blk.-Brn.cf SAND, s. Organic Silt, t. Gravel	4.6'
10										7.0'
		S-3	10.0	12.0	11	14	14	17	Brn. CLAY & SILT, t. f Sand	
15										
		S-4	15.0	17.0	36	45	80	150	Refusal	17.0'
20										
25									Refusal	
30										
35										
40										

I. D. Casing	in	Wgt. Hammer on Casing	lb	Symbol	a.	s.	l.	t.
I. D. Spoon	1-3/8 in	Wgt. Hammer on Spoon	140 lb	Proportions	and	some	little	trace
Type Core Drill		Drop Hammer on Casing	in	% By Wgt.	35 to 50	20 to 35	10 to 20	1 to 10



# PHILIP J. HEALEY COMPANY est. 1870

43 SOUTH AVENUE, FANWOOD, NEW JERSEY 07023

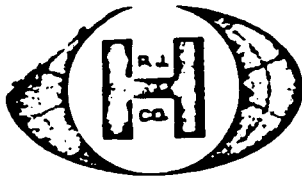
(201) 322-6500

## TEST BORING DATA

Project: Propane Air Facility TEST HOLE NO. 3  
Location: Elizabeth, New Jersey Sheet 1 of 1  
Boring Contractor: Philip J. Healey Company Surface Elevation:  
Inspector: Ground water observations  
Date Started: 6/10/80 Depth: 4.5' Date: 6/10/80  
Date Completed: 6/10/80 Depth: Date:

Depth in Feet	Casing Blows	SAMPLE NO. DEPTH		BLOWS ON SPOON				REC.	SAMPLE IDENTIFICATION AND PROFILE CHANGE	ELEV.
				0	6	12	18			
				6	12	18	24			
		S-1	0.0	2.0	6	6	4	7	FILL: Coal, cinders	
5										4.5'
		S-2	5.0	7.0	3	3	2	3		7.0'
10									Blk. Organic SILT, cinders, vegetation	
		S-3	10.0	12.0	2	2	2	3		12.0'
15		S-4	13.0	15.0	9	11	11	12	Gray-Brn. mf SAND a. Clayey SILT	15.0'
		S-5	15.0	17.0	9	11	11	12		
									Brn. mf SAND, s. Clayey Silt	18.0'
20										
		S-6	20.0	22.0	12	14	14	18		
25		S-7	23.0	25.0	36	64	96	150	Brn. CLAY & SILT, t. f Sand	25.0'
									Refusal	
30										
35										
40										

I. D. Casing	in	Wgt. Hammer on Casing	lb	Symbol	a.	s.	l.	t.
I. D. Spoon	1-3/8 in	Wgt. Hammer on Spoon	140 lb	Proportions	and	some	little	trace
Type Core Drill		Drop Hammer on Casing	in	% By Wgt.	35 to 50	20 to 35	10 to 20	1 to 10
Core Dia.	in	Drop Hammer on Spoon	30 in					



# PHILIP J. HEALEY COMPANY est. 1870

43 SOUTH AVENUE, FANWOOD, NEW JERSEY 07023

(201) 322-6500

## TEST BORING DATA

Project: Propane Air Facility TEST HOLE NO. 4

Location: Elizabeth, New Jersey Sheet 1 of 1

Boring Contractor: Philip J. Healey Company Surface Elevation:

Inspector: Ground water observations

Date Started: 6/10/80 Depth: 3.0' Date: 6/10/80

Date Completed: 6/10/80 Depth: Date:

Depth in Feet	Casing Blows	SAMPLE NO. DEPTH		BLOWS ON SPOON				REC.	SAMPLE IDENTIFICATION AND PROFILE CHANGE	ELEV.
				0	6	12	18			
				6	12	18	24			
		S-1	0.0	2.0	7	10	10	6	FILL: Brn f SAND, s. Clayey Silt, cinders, brick fragments, Gravel	3.0'
5		S-2	5.0	7.0	3	3	3	4	Dk. Gray CLAY & SILT, l. f Sand	5.0'
10		S-3	10.0	12.0	9	11	12	14	Brn. SILT, s. f Sand	8.5'
15		S-4	15.0	17.0	17	20	21	26	Brn. mf SAND, l. Silt	12.0'
20		S-5	20.0	21.0	74	150			Brn. CLAY & SILT, t. f Sand	17.0'
25									Refusal	21.0'
30										
35										
40										

I. D. Casing	in	Wgt. Hammer on Casing	lb	Symbol	a.	s.	l.	t.
I. D. Spoon	1-3/8 in	Wgt. Hammer on Spoon	140 lb	Proportions	and	some	little	trace
Type Core Drill		Drop Hammer on Casing	in	% By Wgt.	35 to 50	20 to 35	10 to 20	1 to 10
Core Dia.	in	Drop Hammer on Spoon	20 in					



# PHILIP J. HEALEY COMPANY est. 1870

43 SOUTH AVENUE, FANWOOD, NEW JERSEY 07023

(201) 322-6500

## TEST BORING DATA

Project: Proposed Sub-Station TEST HOLE NO. 7

Location: Elizabeth, New Jersey Sheet 1 of 1

Boring Contractor: Philip J. Healey Company Surface Elevation:

Inspector: Ground water observations

Date Started: 4/8/81 Depth: 3.5' Date: 4/8/81

Date Completed: 4/8/81 Depth: Date:

	Casing Blows	SAMPLE NO. DEPTH		BLOWS ON SPOON				REC.	SAMPLE IDENTIFICATION AND PROFILE CHANGE	ELEV.
				0 6	6 12	12 18	18 24			
		S-1	0.0	2.0	4	5	5	4	FILL: CINDERS	
										3.5'
5		S-2	5.0	7.0	3	4	5	5		6.6'
10		S-3	10.0	12.0	9	11	12	15	Red-Brn. CLAY & SILT, 1. f Gravel; 1. cf Sand	
										13.0'
15		S-4	13.0	15.0	39	64	100	150	Red-Brn. CLAY & SILT, 1. f Gravel, 1. cf Sand, Shale Fragments	15.0'
									Refusal	
20										
25										
30										
35										
40										

I. D. Casing	in	Wgt. Hammer on Casing	lb	Symbol	a.	s.	l.	t.
I. D. Spoon	1-3/8 in	Wgt. Hammer on Spoon	140 lb	Proportions	and	some	little	trace
Type Core Drill		Drop Hammer on Casing	in	% By Wgt.	35 to 50	20 to 35	10 to 20	1 to 10
Core Dia.	in	Drop Hammer on Spoon	30 in					



# PHILIP J. HEALEY COMPANY est. 1870

43 SOUTH AVENUE, FANWOOD, NEW JERSEY 07023

(201) 322-6500

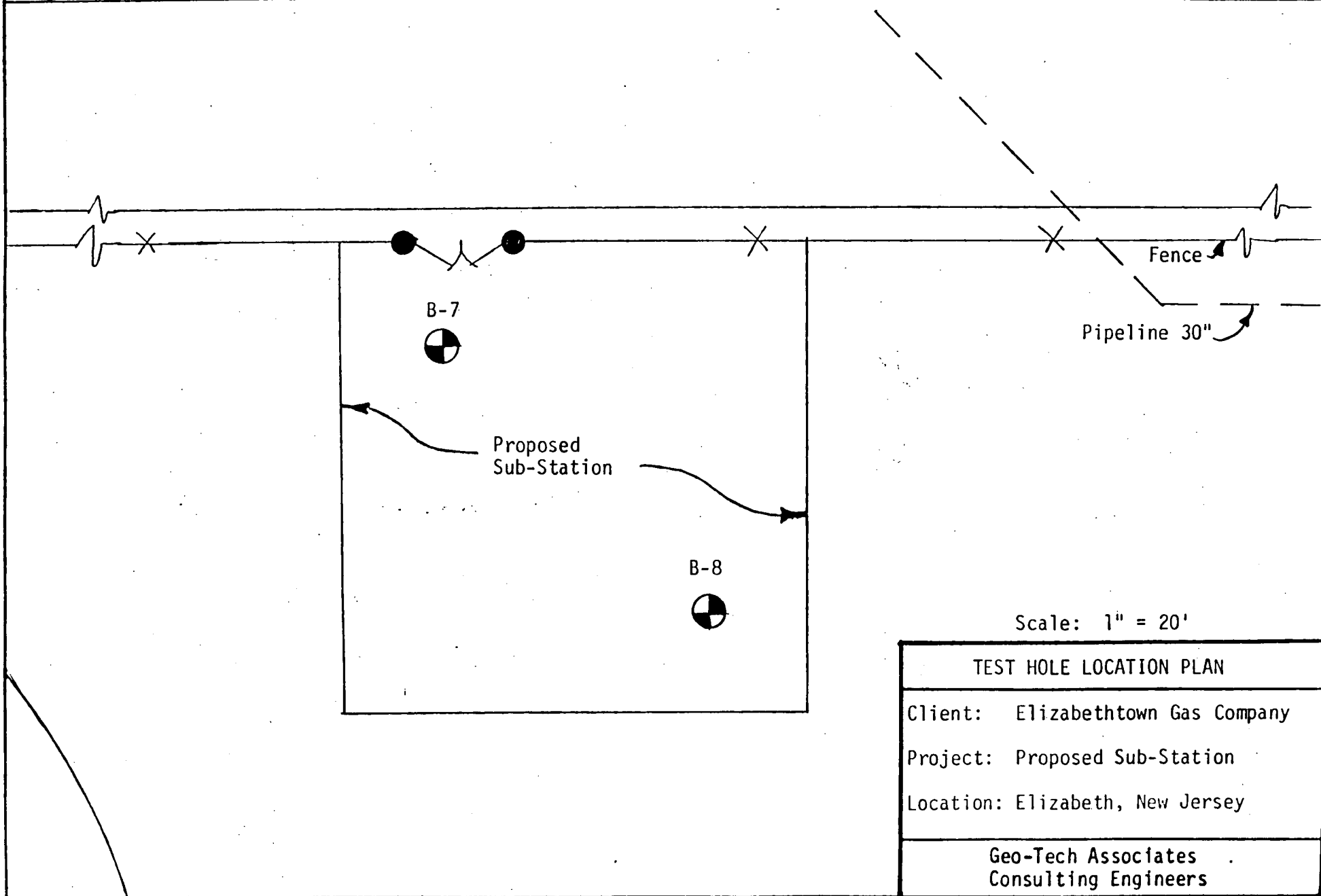
## TEST BORING DATA

Project: Proposed Sub-Station TEST HOLE NO. 8  
Location: Elizabeth, New Jersey Sheet 1 of 1  
Boring Contractor: Philip J. Healey Company Surface Elevation:  
Inspector: Ground water observations  
Date Started: 4/8/81 Depth: 4.5' Date: 4/8/81  
Date Completed: 4/8/81 Depth: Date:

Depth in Feet	Casing Blows	SAMPLE NO. DEPTH		BLOWS ON SPOON				REC.	SAMPLE IDENTIFICATION AND PROFILE CHANGE	ELEV.
				0	6	12	18			
				6	12	18	24			
		S-1	0.0	2.0	3	3	3	2	FILL: CINDERS, s. mf Gravel	
5										4.5'
		S-2	5.0	7.0	7	9	10	12	Red-Brn. CLAY & SILT, 1. f Gravel, 1. cf Sand	5.0'
10										
		S-3	10.0	12.0	12	14	19	19		
15										14.0'
		S-4	15.0	17.0	31	42	75	100	Red-Brn. CLAY & SILT, 1. f Gravel, 1. cf Sand, Shale Fragments	17.0'
20									Refusal	
25										
30										
35										
40										

I. D. Casing	in	Wgt. Hammer on Casing	lb	Symbol	a.	s.	l.	t.
I. D. Spoon	1-3/8 in	Wgt. Hammer on Spoon	140 lb	Proportions	and	some	little	trace
Type Core Drill		Drop Hammer on Casing	in	% By Wgt.	35 to 50	20 to 35	10 to 20	1 to 10
Core Dia.	in	Drop Hammer on Spoon	30 in					

SOUTH SECOND STREET



Scale: 1" = 20'

TEST HOLE LOCATION PLAN

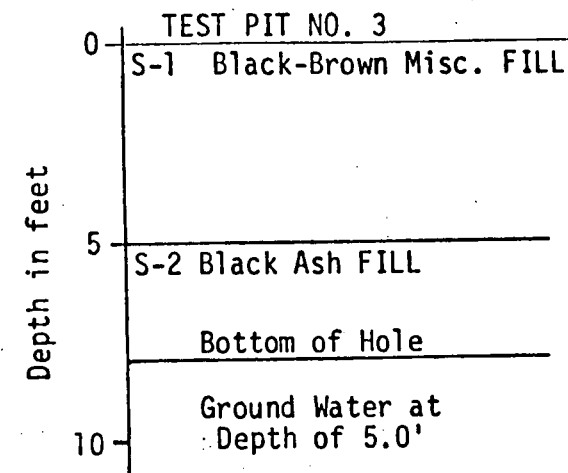
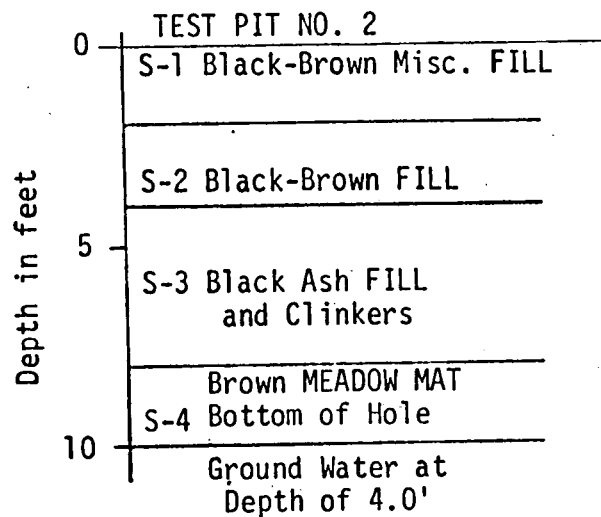
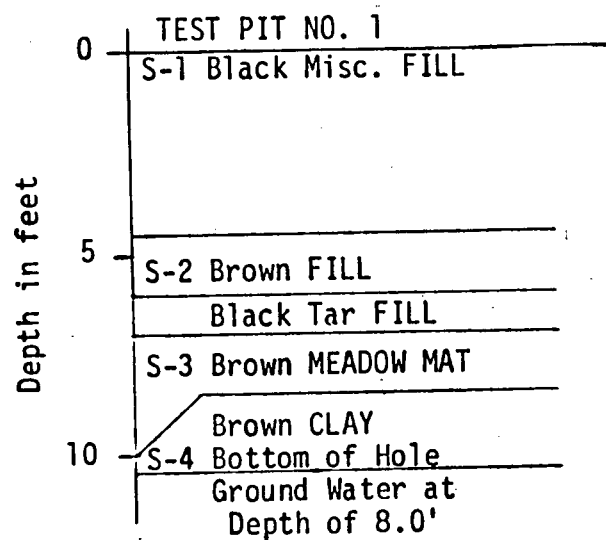
Client: Elizabethtown Gas Company

Project: Proposed Sub-Station

Location: Elizabeth, New Jersey

Geo-Tech Associates  
Consulting Engineers





New Property Line

TP-2

TP-1

Temporary Easement

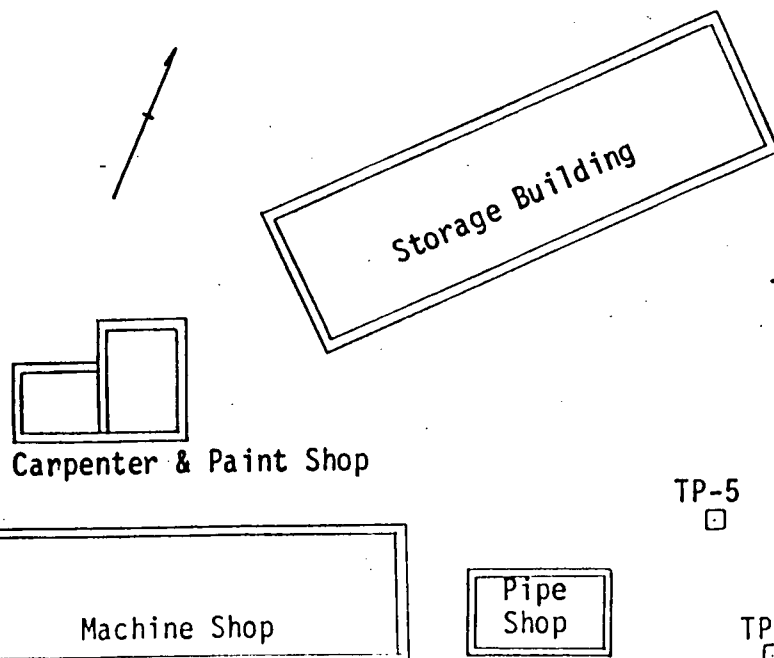
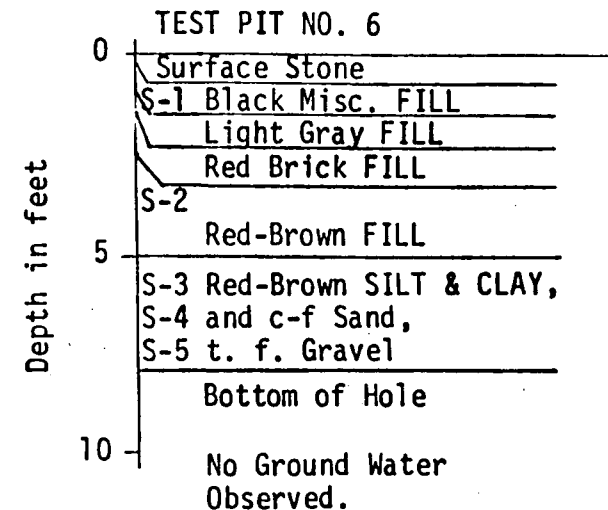
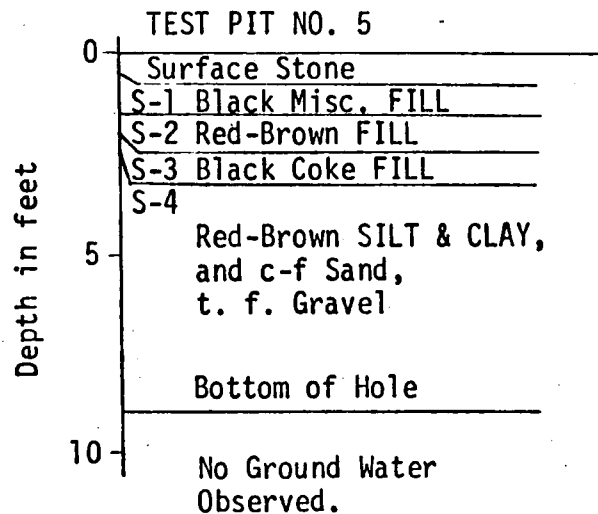
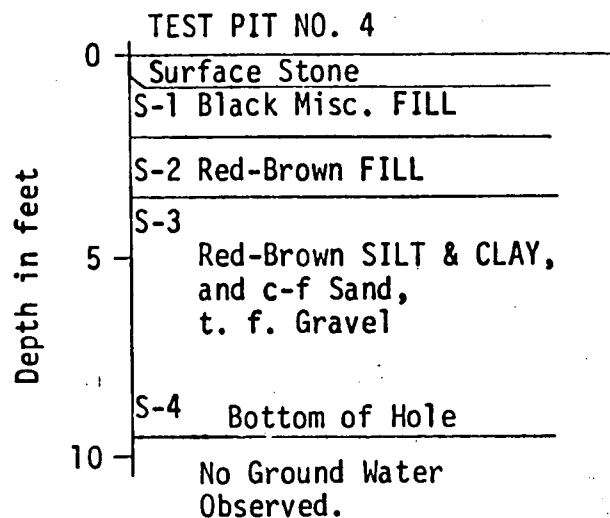
Scale:  $\frac{\text{PLAN}}{1''} = 60'$

10,000,000 cu.ft.  
Gas Storage Holder

Elizabethtown Gas Company  
Erie Street Plant  
Elizabeth, N. J.

PLAN & LOG OF TEST PITS  
PROPANE TANKS (MARCH 27, 1973)

Geo-Tech Associates  
Fanwood, N. J.

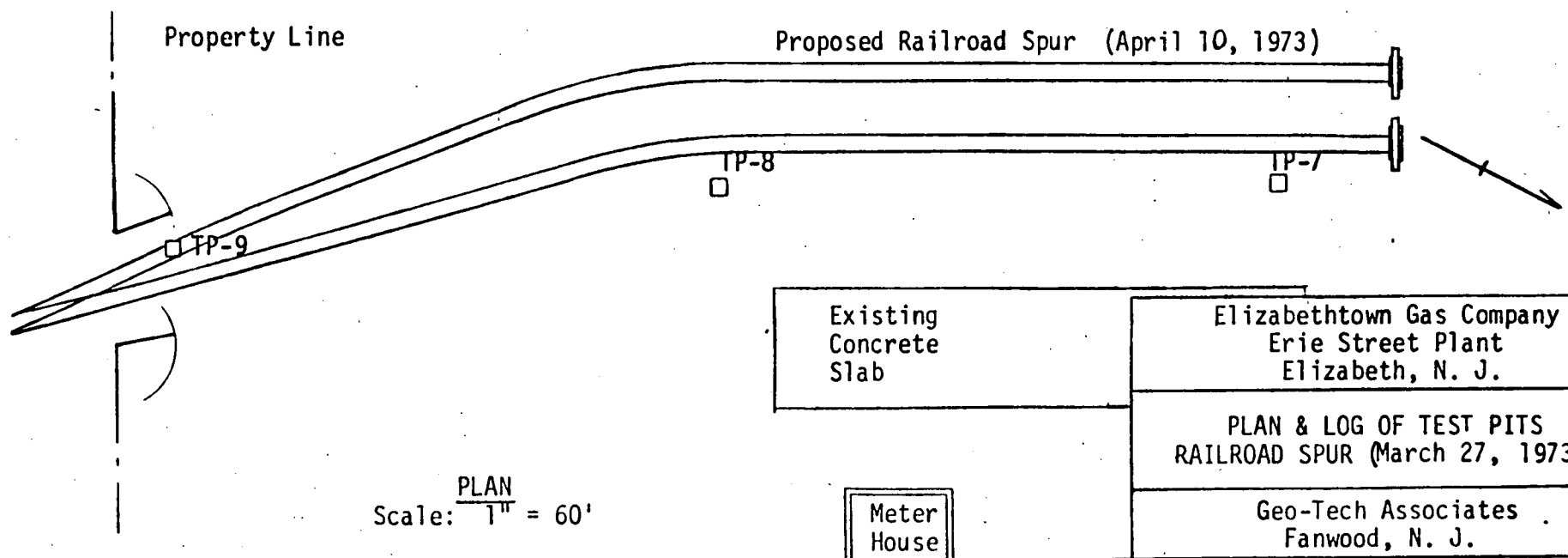
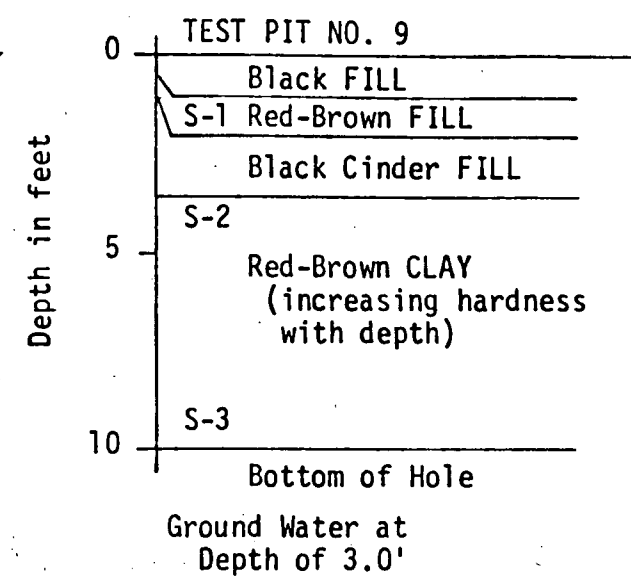
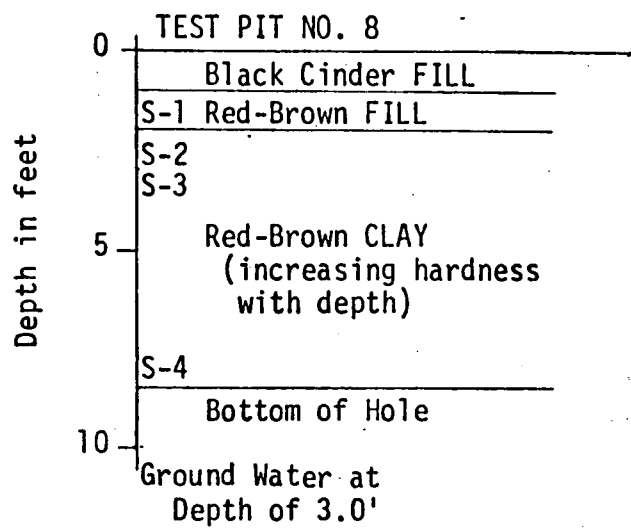
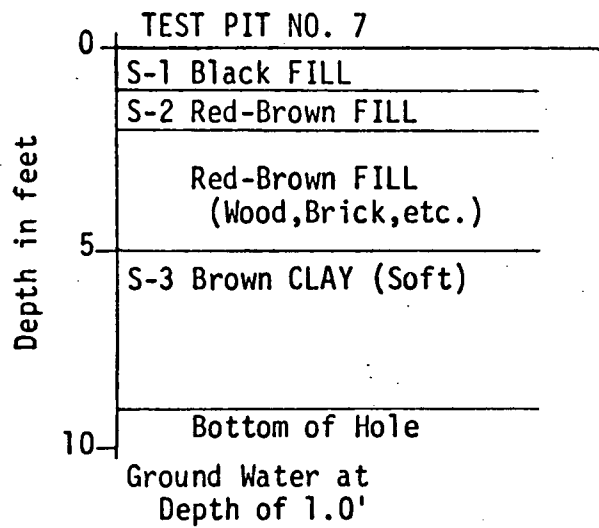


Elizabethtown Gas Company  
Erie Street Plant  
Elizabeth, N. J.

PLAN & LOG OF TEST PITS  
PROPOSED BUILDING (MARCH 27, 1973)

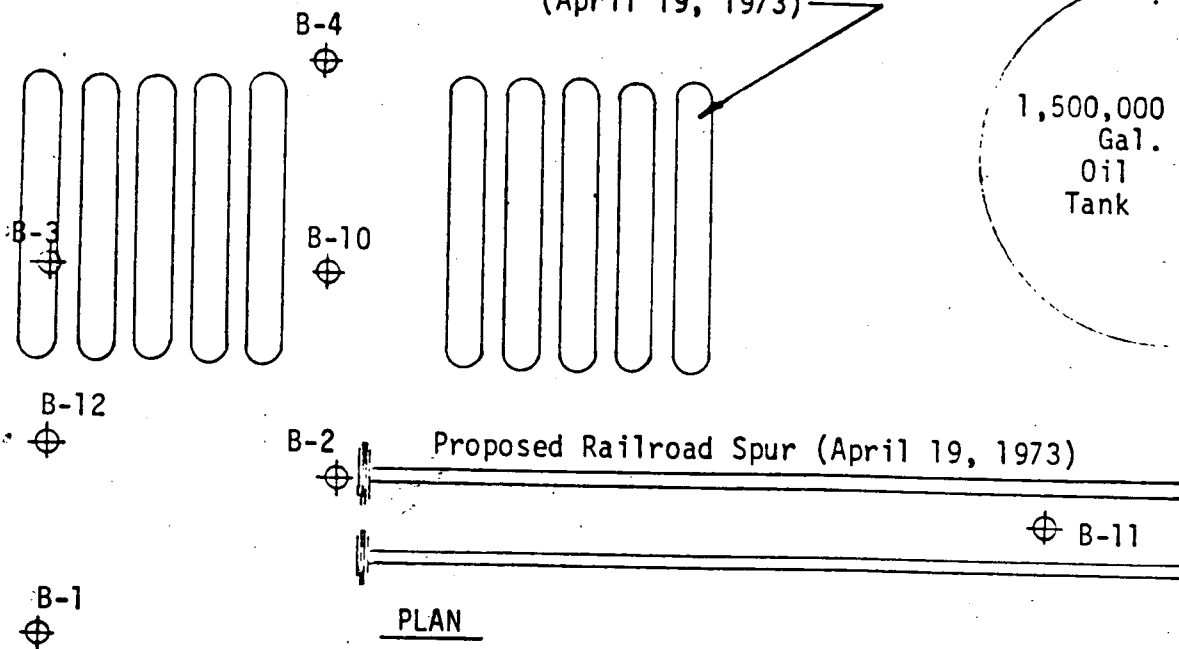
Geo-Tech Associates  
Fanwood, N. J.

PLAN  
Scale: 1" = 60'

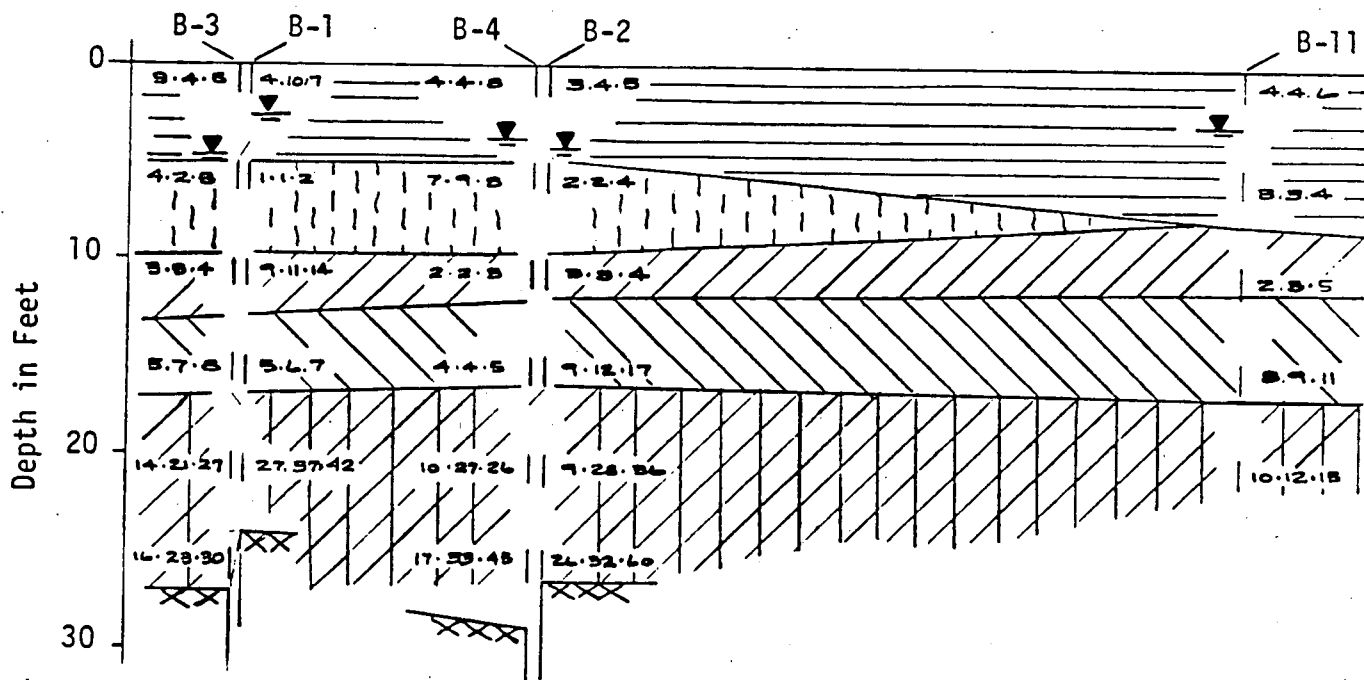


Proposed Propane  
Storage Tanks  
(April 19, 1973)

1,500,000  
Gal.  
Oil  
Tank



Scale: 1" = 60'



Legend:

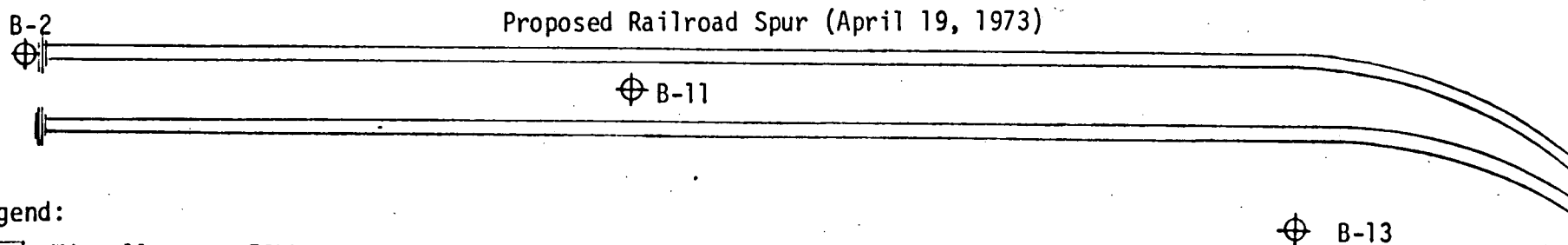
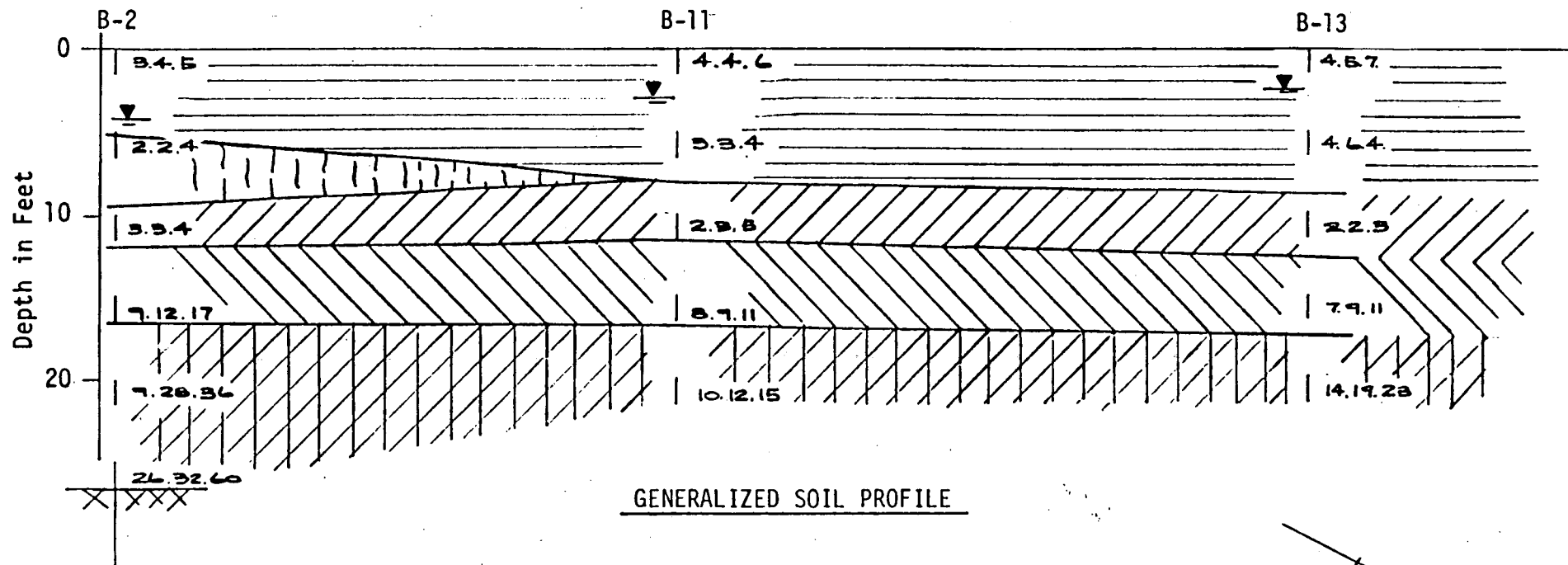
- Miscellaneous FILL
- PEAT & ORGANIC SILT
- Gray Silty CLAY
- Red medium to fine SAND
- Red-Brown TILL
- Bedrock

GENERALIZED SOIL PROFILE

Elizabethtown Gas Company  
Erie Street Plant  
Elizabeth, N. J.

BORING PLAN AND PROFILE  
PROPANE TANKS (APRIL 19, 1973)

Geo-Tech Associates  
Fanwood, N. J.

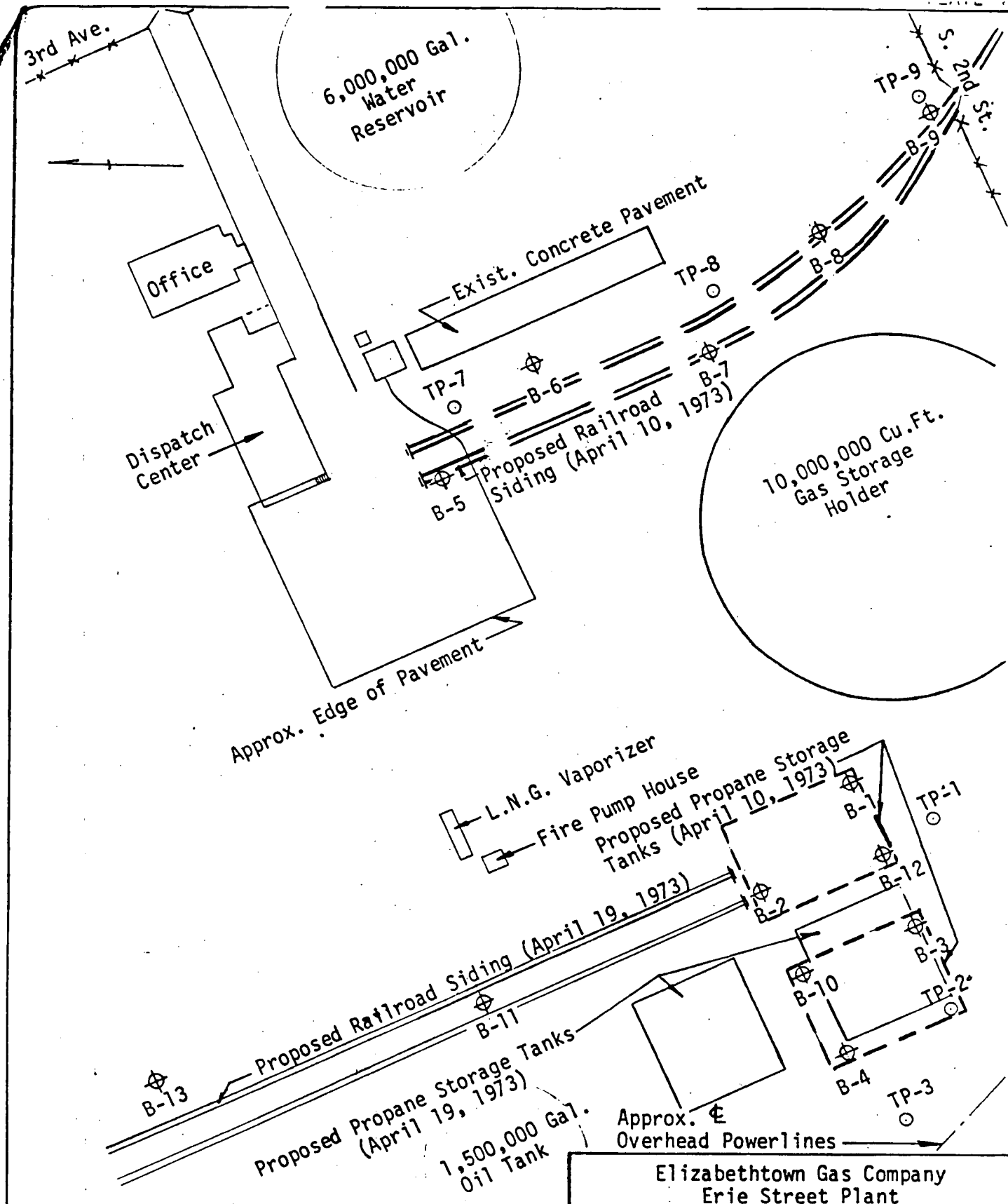


**Legend:**

- Miscellaneous FILL
- PEAT & ORGANIC SILT
- Gray Silty CLAY
- Red medium to fine SAND
- Red-Brown TILL
- Bedrock

**PLAN**  
Scale: 1" = 60'

Elizabethtown Gas Company Erie Street Plant Elizabeth, N. J.
BORING PLAN AND PROFILE Railroad Spur (April 19, 1973)
Geo-Tech Associates Fanwood, N. J.



Scale: 1" = 100'

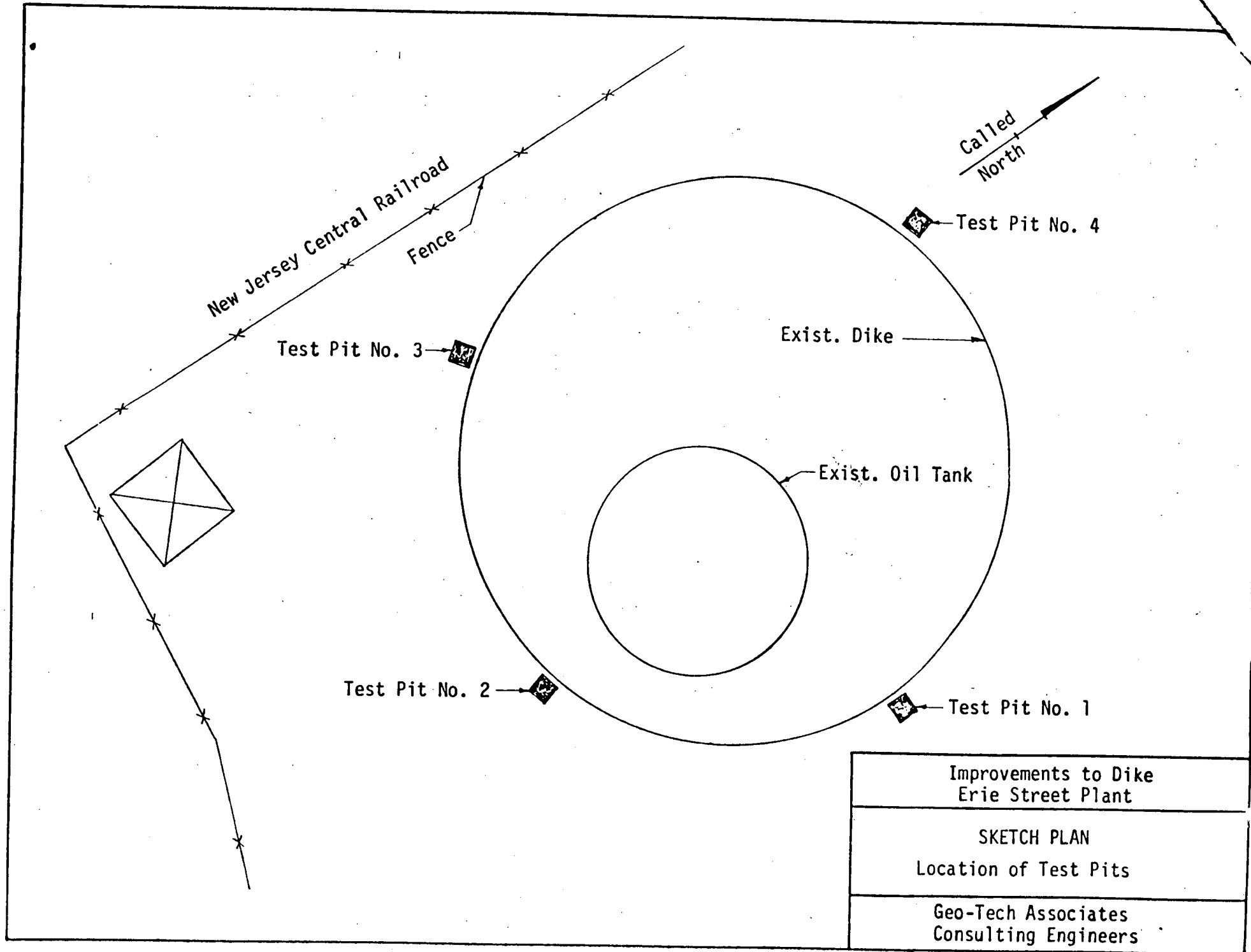
Legend:

- Test Pit Location
- ⊕ Test Boring Location

Elizabethtown Gas Company  
Erie Street Plant  
Elizabeth, N. J.

GENERAL SITE PLAN

Geo-Tech Associates  
Fanwood, N. J.



Improvements to Dike  
Erie Street Plant

SKETCH PLAN  
Location of Test Pits

Geo-Tech Associates  
Consulting Engineers

Depth in Feet

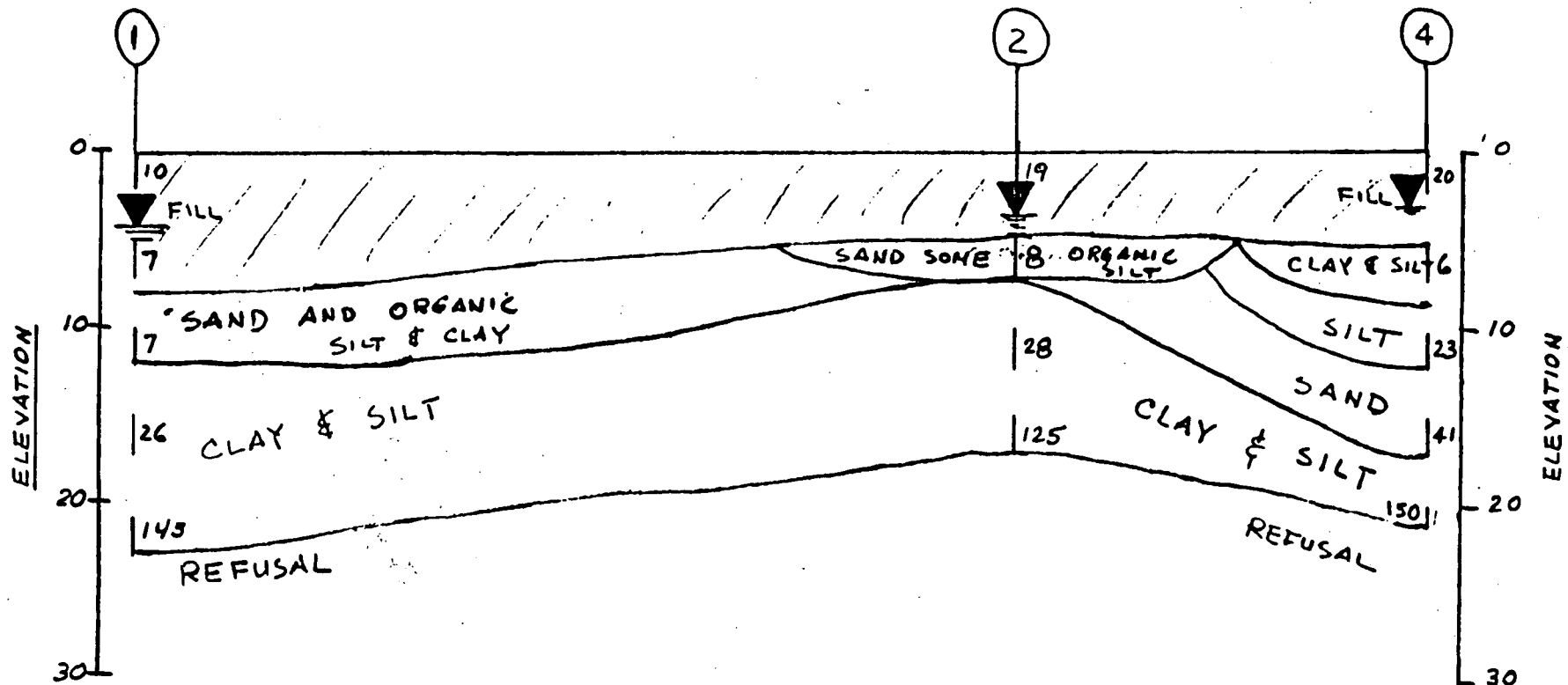
0	TEST PIT No.1	TEST PIT No.2	TEST PIT No.3	TEST PIT No.4
	Red-Brown FILL Same as above, with oil & pieces of wood	Brown FILL	Red-Brown FILL Same as above, with oil & pieces of wood	Brown FILL Same as above, with oil, pieces of wood, clinkers & coke
	Red-Brown CLAY & SILT	Red-Brown CLAY & SILT	Brown CLAY & SILT	
5	Gray-Green Meadow Mat		Black, oily Cinder FILL	
	Red-Brown c-f SAND, some c-f Gravel, little Silt	Same as above, with Clinkers	Gray-Green Meadow Mat	Gray-Green Meadow Mat
10	Water seepage at 3'	Gray-Green Meadow Mat	Red-Brown CLAY	Water Seepage at 3'
		Red-Brown CLAY	No Water Observed	Improvements to Dike Erie Street Plant
15		Water seepage at 13'		SKETCH PROFILE Log of Test Pits
				Geo-Tech Associates Consulting Engineers



PROJECT Propane Air Facility  
SUBJECT Schematic Soil Profile  
COMPUTED BY A.F.

JOB NO. 80-179  
SHEET NO. 1 OF 1  
DATE 6-23-80

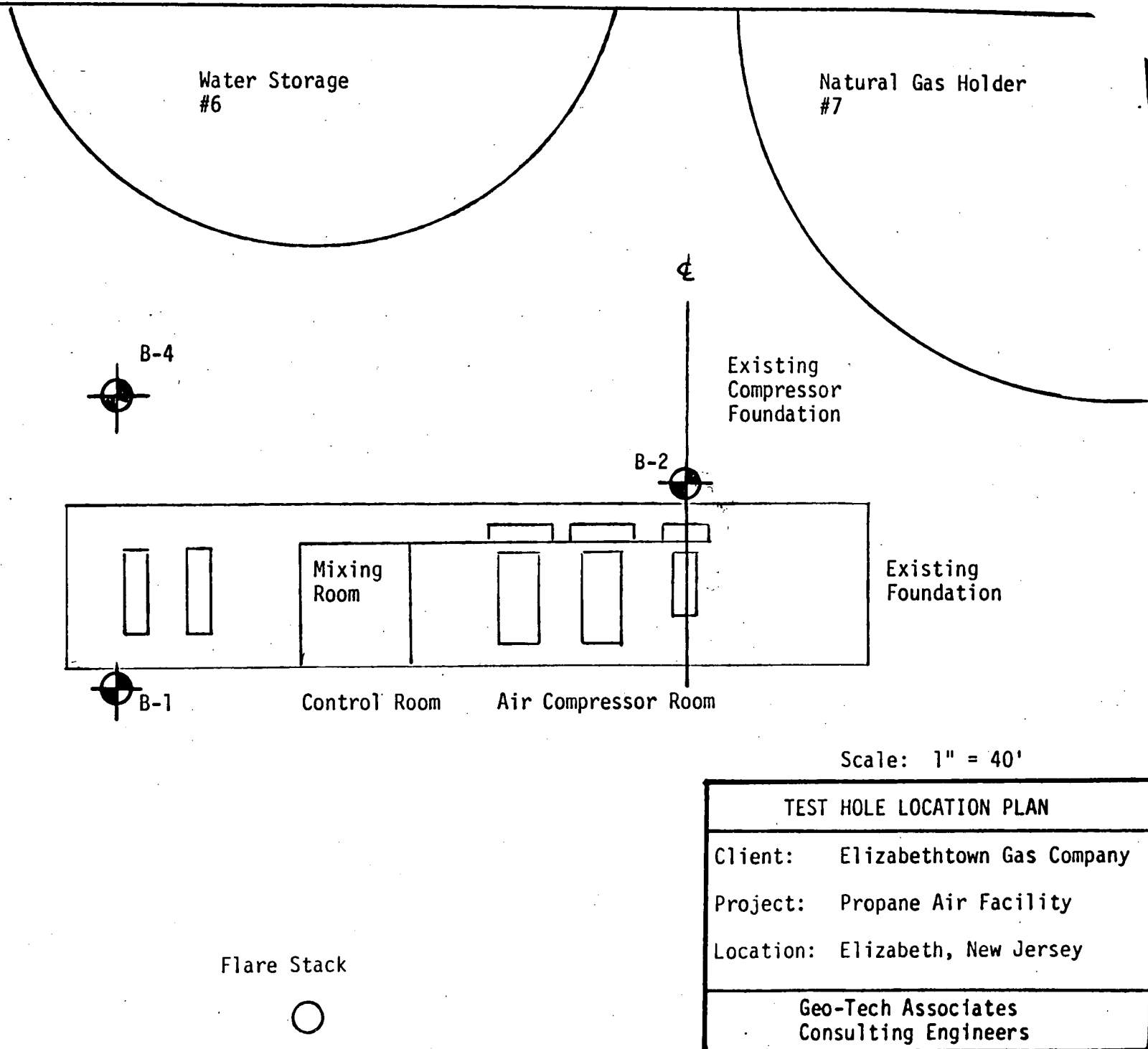
CHECKED BY



# SCHEMATIC SOIL PROFILE

SCALE: HORIZONTAL 1"=10'  
VERTICAL 1"=10'

FLORIDA STREET



TEST HOLE LOCATION PLAN

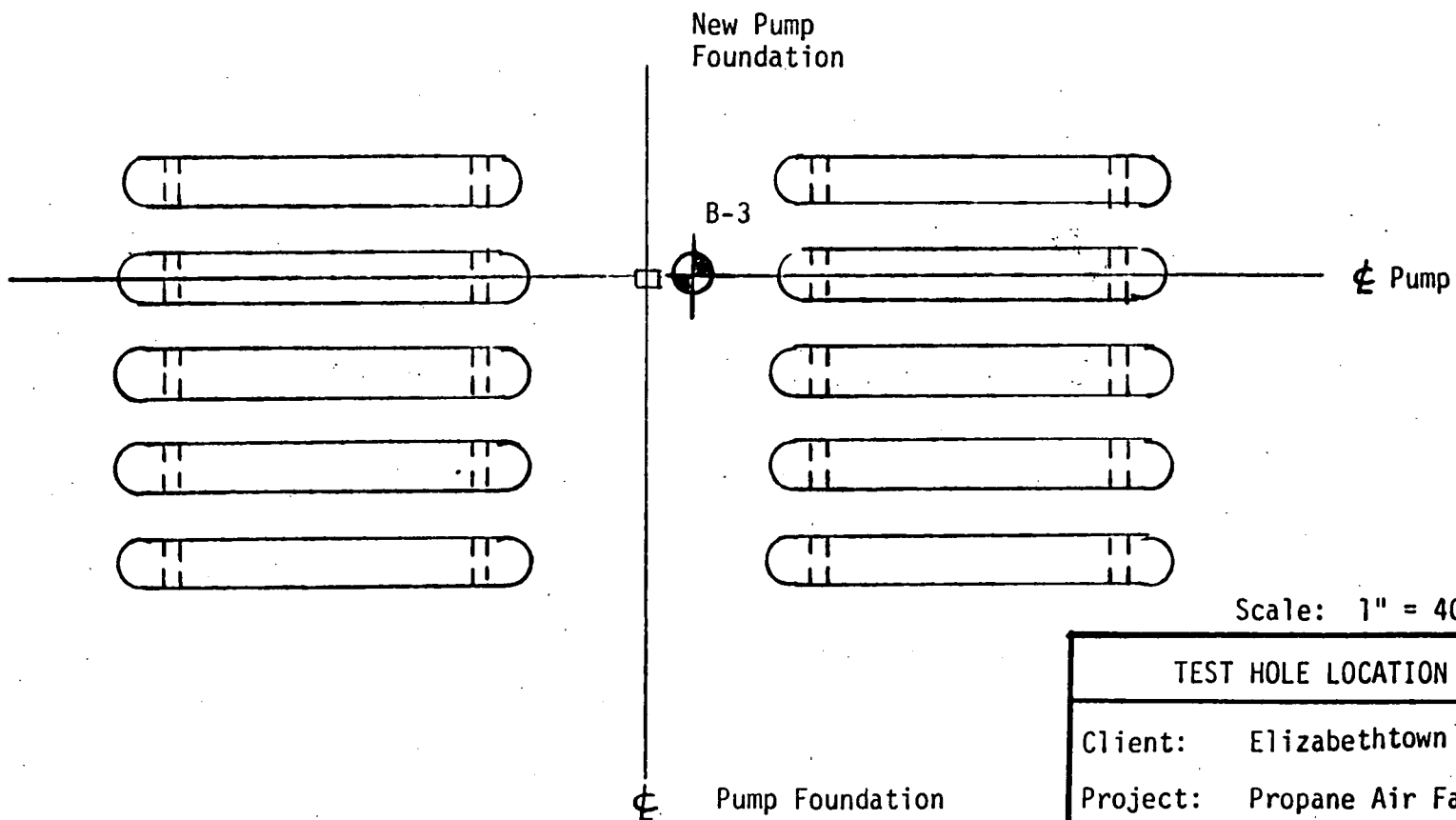
Client: Elizabethtown Gas Company

Project: Propane Air Facility

Location: Elizabeth, New Jersey

Geo-Tech Associates  
Consulting Engineers

FLORIDA STREET



Scale: 1" = 40'

#### TEST HOLE LOCATION PLAN

Client: Elizabethtown Gas Company  
Project: Propane Air Facility  
Location: Elizabeth, New Jersey

Geo-Tech Associates  
Consulting Engineers



**REFERENCE NO. 7**

# **Uncontrolled Hazardous Waste Site Ranking System**

## **A Users Manual** (HW-10)

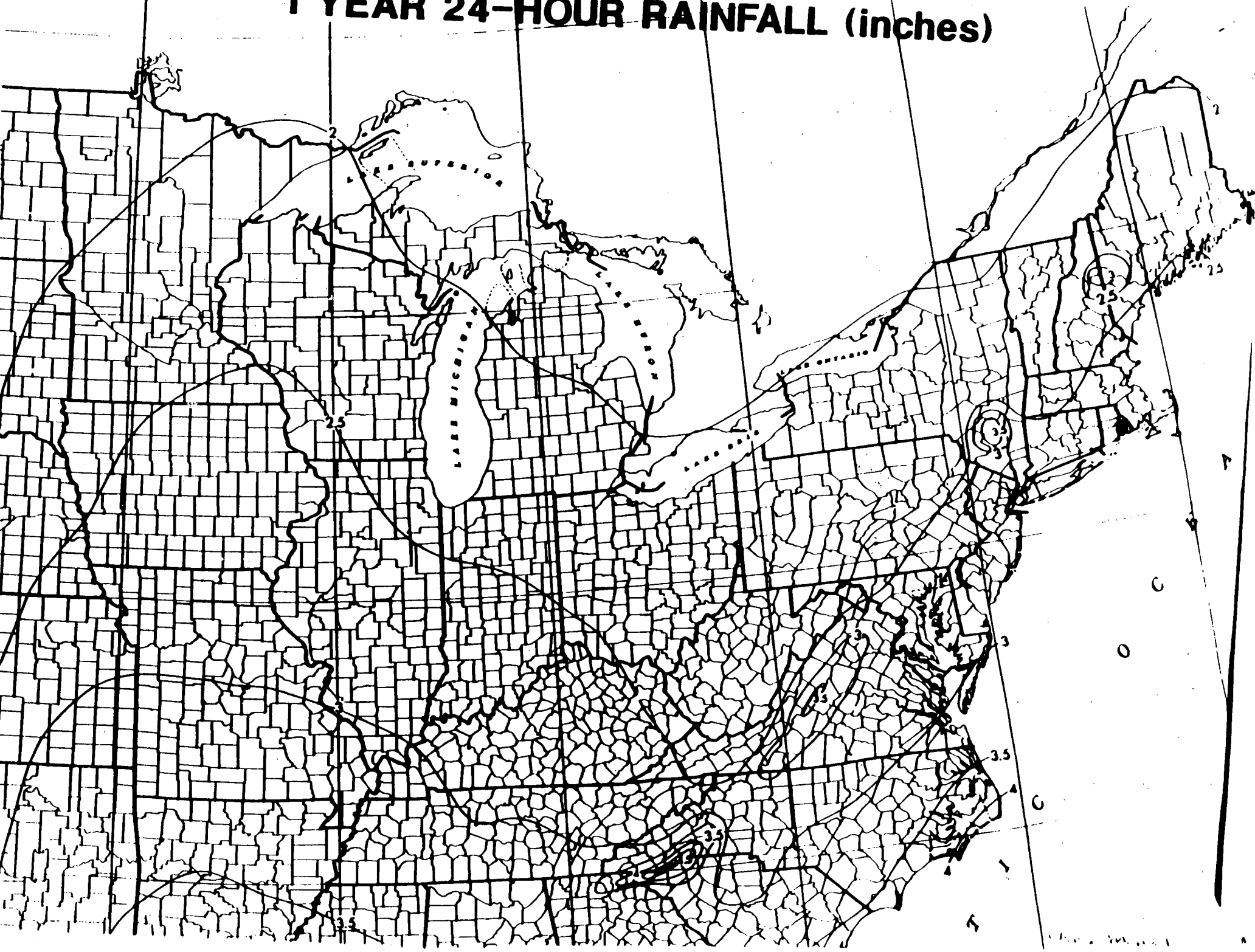
Originally Published in  
the July 16, 1982, *Federal Register*

United States  
Environmental Protection  
Agency

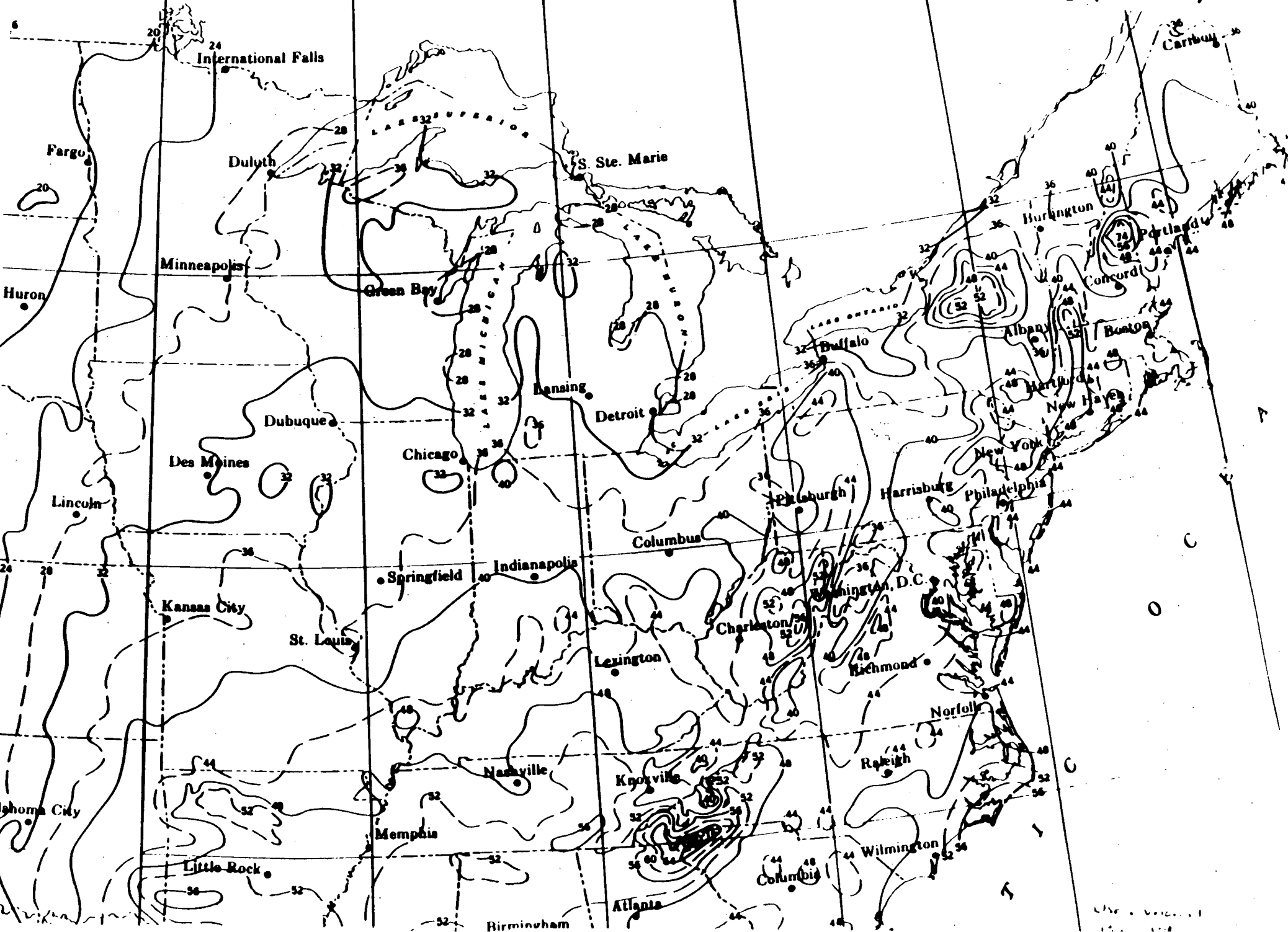
1984

# 1 YEAR 24-HOUR RAINFALL (inches)

This map displays the 1-year 24-hour rainfall isohyets for the Great Lakes region. The isohyets are labeled with values in inches, including 2, 2.5, 3, 3.5, and 4. The map shows the Great Lakes (Superior, Michigan, Huron, Erie, Ontario) and the surrounding land areas. The rainfall generally increases from the north and west towards the south and east, with the highest values (4 inches) concentrated in the southeastern part of the region. The map is overlaid with a grid of latitude and longitude lines.



# NORMAL ANNUAL TOTAL PRECIPITATION (Inches)





**MEAN ANNUAL LAKE EVAPORATION  
(In Inches)**

Based on period 1946-55

U.S. Map  
Page 13

**MEAN ANNUAL LAKE EVAPORATION  
(In Inches)**

Based on period 1946-55

GULF OF MEXICO

U.S. Map  
Page 13

HAWAII

TABLE 2  
PERMEABILITY OF GEOLOGIC MATERIALS\*

Type of Material	Approximate Range of Hydraulic Conductivity	Assigned Value
Clay, compact till, shale; unfractured metamorphic and igneous rocks	$<10^{-7}$ cm/sec	0
Silt, loess, silty clays, silty loams, clay loams; less permeable limestone, dolomites, and sandstone; moderately permeable till	$10^{-5} - 10^{-7}$ cm/sec	1
Fine sand and silty sand; sandy loams; loamy sands; moderately permeable limestone, dolomites, and sandstone (no karst); moderately fractured igneous and metamorphic rocks, some coarse till	$10^{-3} - 10^{-5}$ cm/sec	2
Gravel, sand; highly fractured igneous and metamorphic rocks; permeable basalt and lavas; karst limestone and dolomite	$>10^{-3}$ cm/sec	3

\*Derived from:

Davis, S. N., Porosity and Permeability of Natural Materials in Flow-Through Porous Media, R.J.M. DeWitt ed., Academic Press, New York, 1969

Freeze, R.A. and J.A. Cherry, Groundwater, Prentice-Hall, Inc., New York, 1979

**REFERENCE NO. 8**

CONTROL NO:

02-8912-06

DATE:

2/14/90

TIME:

1415

DISTRIBUTION:

REICHHOLD CHEMICAL INC.

BETWEEN:

RICHARD A. SADOWSKI

OF: ELIZABETHTOWN  
WATER CO.

PHONE:

(201) 654-1234

AND:

W. J. FOSS

DISCUSSION:

(NUS)

I asked Mr. Sadowski if there are potable or groundwater wells in service within a 3-mile radius of Reichhold Chemical Inc. He informed that any wells located within 3 miles are out of service and are not being used. I inquired about the existence of any surface water intakes. He said there are none that exist.

ACTION ITEMS:

**REFERENCE NO. 9**

## NUS CORPORATION

0013-C  
02-8912-0

TELECON NOTE

CONTROL NO:

02-8912-06

DATE:

2/14/90

TIME:

1430

DISTRIBUTION:

REICHOLD CHEMICAL, INC.

BETWEEN:

JOAN MORAN

OF: CITY OF ELIZABETH

PHONE:

AND:

WATER UTILITY

(201) 920-4265

W.S. FOSS

DISCUSSION:

(NUS)

I asked if there were any ground water wells used as a potable water supply. Mrs. Moran informed there are no wells used for a potable water supply. They buy water from Elizabethton Water Co. and the City of Newark Water Department. I also asked about any surface water intakes <sup>under</sup> their jurisdiction management. She said there are no surface intakes under their management.

ACTION ITEMS:

**REFERENCE NO. 10**

## NUS CORPORATION AND SUBSIDIARIES

TELECON NOTE

CONTROL NO.:

00-9004-37

DATE:

5/1/90

TIME:

1510

DISTRIBUTION:

ELIZABETH COAL GAS SITE #1

BETWEEN:

LISA BALBOA

OF: CITY OF ELIZABETH

WATER DEPARTMENT

PHONE:

(201) 820-4120

AND:

RICHARD SETTINO

(NUS)

DISCUSSION:

I asked Ms. Balboa where Elizabeth gets its water for public supply. She told me that Elizabeth buys its water from the Elizabethtown Water Company and the Newark Water Company.

ACTION ITEMS:



**REFERENCE NO. 11**

## NUS CORPORATION AND SUBSIDIARIES

TELECON NOTE

CONTROL NO.:

02-9004-37

DATE:

5-10-90

TIME:

1340

DISTRIBUTION:

ELIZABETH COAL GAS SITE #1

BETWEEN:

Arlene Potts

OF: ELIZABETHTOWN

WATER COMPANY

PHONE:

(201) 654-1234

AND:

RICHARD SETTIWO

(NUS)

DISCUSSION:

I asked Ms. Potts where Elizabethtown Water Company gets its water. She told me that ~~all~~ they receive their water from the Baritan River. I also ~~also~~ asked where the intakes were located. She told me they are located in Bridgewater.



ACTION ITEMS:

REFERENCE NO. 12

## NUS CORPORATION AND SUBSIDIARIES

TELECON NOTE

CONTROL NO.:

02-9004-37

DATE:

5-10-90

TIME:

1410

DISTRIBUTION:

ELIZABETH COAL GAS SITE #1

BETWEEN:

JOHN TARASUK

OF:

CITY OF NEWARK  
WATER DEPARTMENT

PHONE:

(201) 256-4965

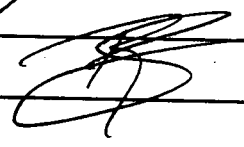
AND:

RICHARD SETTINO

(NUS)

DISCUSSION:

I asked ~~Mr.~~ Mr. Tarasuk where the Water Dept. got its water from. He told me that the Dept. was in charge of the Pequannock Water Shed. They possessed 5 reservoirs which supply approximately 60 million gallons of water per day to Newark and surrounding communities.




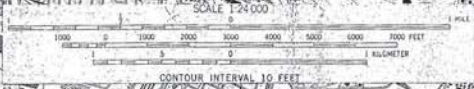
ACTION ITEMS:

**REFERENCE NO. 13**





	TITLE: THREE MILE VICINITY MAP	
	SITE: ELIZABETH COAL GAS SITE #1, ELIZABETH, N.J.	
DATE: 4/25/90		
TOD: 02-9004-37		
QUAD: ELIZABETH, N.J.	FIGURE NUMBER:	SCALE: 1"=2000'





REFERENCE NO. 14



# Surface Water Quality Standards

## SURFACE WATER QUALITY STANDARDS

N.J.A.C. 7:9-4.1 et seq.

May 1985



once-through basis for the duration of the test, in accordance with N.J.A.C. 7:18.

"Fresh water(s)" means all nontidal and tidal waters generally having a salinity, due to natural sources, of less than or equal to 3.5 parts per thousand at mean high tide.

"FW" means the general surface water classification applied to fresh waters.

"FW1" means those fresh waters that originate in and are wholly within Federal or State parks, forests, fish and wildlife lands, and other special holdings, that are to be maintained in their natural state of quality (set aside for posterity) and not subjected to any man-made wastewater discharges, as designated in Index A incorporated into this subchapter.

"FW2" means the general surface water classification applied to those fresh waters that are not designated as FW1 or Pinelands Waters.

"Heat dissipation area" means a mixing zone, as may be designated by the Department, into which thermal effluents may be discharged for the purpose of mixing, dispersing, or dissipating such effluents without creating nuisances, hazardous conditions, or violating the provisions of this subchapter.

"Hypolimnion" means the lower region of a stratified waterbody that extends from the thermocline to the bottom of the waterbody, and is isolated from circulation with the upper waters, thereby receiving little or no oxygen from the atmosphere.

"Important species" means species that are commercially valuable (e.g., within the top ten species landed, by dollar value); recreationally valuable; threatened or endangered; critical to the organization and/or maintenance of the ecosystem; or other species necessary in the food web for the well-being of the species identified in this definition.

"Industrial water supply" means water used for processing or cooling.

"Intermittent stream" means a stream with a MA7CD10 flow of less than one-tenth (0.1) cubic foot per second.

"Lake, pond, or reservoir" means any impoundment, whether naturally occurring or created in whole or in part by the building of structures for the retention of surface water, excluding sedimentation control and stormwater retention/detention basins.

"LC50" means the median lethal concentration of a toxic substance, expressed as a statistical estimate of the concentration that kills 50 percent of the test organisms under

characteristics, but are suitable for a wide variety of other fish species.

"NPDES" means National Pollutant Discharge Elimination System.

"NT" means nontrout waters.

"Nutrient" means a chemical element or compound, such as nitrogen or phosphorus, which is essential to and promotes the growth and development of organisms.

"Outstanding National Resource Waters" means high quality waters that constitute an outstanding national resource (for example, waters of National/State Parks and Wildlife Refuges and waters of exceptional recreational or ecological significance) as designated in Index G incorporated into this subchapter.

"Persistent" means relatively resistant to degradation, generally having a half life of over 96 hours.

"Pinelands waters" means all waters within the boundaries of the Pineland Area, except those waters designated as FWI in this subchapter, as established in the Pinelands Protection Act N.J.S.A. 13:18A-1 et seq. and shown on Plate 1 of the

"Comprehensive Management Plan" adopted by the New Jersey Pinelands Commission in November 1980.

"PL" means the general surface water classification applied to Pinelands Waters.

"Primary contact recreation" means recreational activities that involve significant ingestion risks and includes, but is not limited to, wading, swimming, diving, surfing, and water skiing.

"Public hearing" means a legislative type hearing before a representative or representatives of the Department providing the opportunity for public comment, but does not include cross-examination.

"River mile" means the distance, measured in statute miles, between two locations on a stream, with the first location designated as mile zero. Mile zero for the Delaware River is located at the intersection of the centerline of the navigation channel and a line between the Cape May Light, New Jersey, and the tip of Cape Henlopen, Delaware.

"Saline waters" means waters having salinities generally greater than 3.5 parts per thousand at mean high tide.

"SC" means the general surface water classification applied to coastal saline waters.

"SE" means the general surface water classification applied to saline waters of estuaries.



# Surface Water Classifications

Surface Water Quality Standards  
N.J.A.C. 7:9-4

Index D-

Surface Water Classifications of the Passaic,  
Hackensack and N.Y. Harbor Complex Basin

July 1985

- (c) In all FW2 waters the designated uses are:
1. Maintenance, migration and propagation of the natural and established biota;
  2. Primary and secondary contact recreation;
  3. Industrial and agricultural water supply;
  4. Public potable water supply after such treatment as required by law or regulation; and
  5. Any other reasonable uses.
- (d) In all SE1 waters the designated uses are:
1. Shellfish harvesting in accordance with N.J.A.C. 7:12;
  2. Maintenance, migration and propagation of the natural and established biota;
  3. Primary and secondary contact recreation; and
  4. Any other reasonable uses.
- (e) In all SE2 waters the designated uses are:
1. Maintenance, migration and propagation of the natural and established biota;
  2. Migration of diadromous fish;
  3. Maintenance of wildlife;
  4. Secondary contact recreation; and
  5. Any other reasonable uses.
- (f) In all SE3 waters the designated uses are:
1. Secondary contact recreation;
  2. Maintenance and migration of fish populations;
  3. Migration of diadromous fish;
  4. Maintenance of wildlife; and
  5. Any other reasonable uses.
- (g) In all SC waters the designated uses are:
1. Shellfish harvesting in accordance with N.J.A.C. 7:12;

INDEX D - Surface Water Classifications of the Passaic,  
Hackensack and N.Y. Harbor Complex Basin

ARTHUR KILL	
(Perth Amboy) - The Kill and its saline New Jersey tributaries between the Outerbridge Crossing and a line connecting Ferry Pt., Perth Amboy to Wards Pt., Staten Island, N.Y.	SE2
(Elizabeth) - From an east-west line connecting Elizabethport with Bergen Pt., Bayonne to the Outerbridge Crossing	SE3
(Woodbridge) - All freshwater tributaries	FW2-NT
BEAR SWAMP BROOK (Mahwah) - Entire length	FW2-TP (C1)
BEAR SWAMP LAKE (Ringwood)	FW2-NT (C1)
BEAVER BROOK (Meriden) - Entire length	FW2-NT
BELCHER CREEK (W. Milford) - Entire length	FW2-NT
BERRYS CREEK (Secaucus) - Entire length	FW2-NT/SE2
BLACK BROOK	
(Meyersville) - Entire length, except segment described below	FW2-NT
(Great Swamp) - Segment and tributaries within the Great Swamp National Wildlife Refuge	FW2-NT (C1)
BLUE MINE BROOK	
(Wanaque) - Entire length, except segment described below	FW2-TM
(Norvin Green State Forest) - That portion of the stream and any tributaries within Norvin Green State Forest	FW2-TM (C1)
BRUSHWOOD POND (Ringwood)	FW2-NT (C1)
BUCKABEAR POND (Newfoundland) - Pond, its tributaries and connecting stream to Clinton Reservoir	FW2-NT (C1)
CANISTEAR RESERVOIR (Vernon)	FW2-TM
CANISTEAR RESERVOIR TRIBUTARY (Vernon) - The southern branch of the eastern tributary to the Reservoir	FW1
CANOE BROOK (Chatham) - Entire length	FW2-NT
CEDAR POND (Clinton) - Pond and all tributaries	FW1
CHARLOTTEBURG RESERVOIR (Charlotteburg)	FW2-TM
CHERRY RIDGE BROOK	
(Vernon) - Entire length, except segments described below	FW2-NT
(Canistear) - Brook and tributaries upstream of Canistear Reservoir located entirely within the boundaries of Wawayanda State Park and the Newark Watershed lands	FW1
CLINTON BROOK	
(Mossmans Brook) (W. Milford) - Source to, but not including, Clinton Reservoir	FW2-NT (C1)
(Newfoundland) - Clinton Reservoir dam to Pequannock River	FW2-TP (C1)
CLINTON RESERVOIR (W. Milford)	FW2-TM (C1)
CLOVE BROOK - See STAG BROOK	

COOLEY BROOK	
(W. Milford) - Entire length, except segments described below	FW2-TP(C1)
(Hewitt) - Segments of the brook and all tributaries located entirely within Hewitt State Forest	FW1 [tp]
CORYS BROOK (Warren) - Entire length	
CRESSKILL BROOK	FW2-NT
(Alpine) - Source to Duck Pond Rd. bridge, Demarest	FW2-TP(C1)
(Demarest) - Duck Pond Rd. bridge to Tenakill Brook	FW2-NT
CUPSAW BROOK	
(Skylands) - Source to Cupsaw Lake dam, except segment described below	FW2-NT
(Skylands) - That segment of Cupsaw Brook above the dam and within the boundaries of Ringwood State Park	FW2-NT(C1)
(Skylands) - Cupsaw Lake dam to mouth	FW2-TM
DEAD RIVER (Liberty Corners) - Entire length	FW2-NT
DEN BROOK (Denville) - Entire length	FW2-NT
DUCK POND (Ringwood)	FW2-NT(C1)
ELIZABETH RIVER	
(Elizabeth) - Source to Broad St. bridge, Elizabeth and all freshwater tributaries	FW2-NT
(Elizabeth) - Broad St. bridge to mouth	SE3
FOX BROOK (Mahwah) - Entire length	FW2-NT
GLASMERE POND (Ringwood)	FW2-NT(C1)
GOFFLE BROOK (Hawthorne) - Entire length	FW2-NT
GRANNIS BROOK (Morris Plains) - Entire length	FW2-NT
GREAT BROOK	
(Chatham) - Entire length, except segment described below	FW2-NT
(Great Swamp) - Segment within the boundaries of the Great Swamp National Wildlife Refuge	FW2-NT(C1)
GREEN BROOK	
(W. Milford) - Entire length, except those segments described below	FW2-TP(C1)
(Hewitt) - Those segments located entirely within the Hewitt State Forest boundaries	FW1 [tp]
GREEN POND (Rockaway)	FW2-TM
GREEN POND BROOK (Picatinny Arsenal) - Green Pond outlet to Rockaway River	FW2-NT
GREENWOOD LAKE (W. Milford)	FW2-TM
HACKENSACK RIVER	
(Oradell) - Source to Oradell dam	FW2-NT
(Oradell) - Main stem and saline tributaries from Oradell dam to the confluence with Overpeck Creek	SE1
(Little Ferry) - Main stem and saline tributaries from Overpeck Creek to confluence with Berrys Creek	SE2
(Secaucus) - Main stem from Berrys Creek to Route 1 & 9 crossing	SE2
(Kearny Point) - Main stem downstream from Route 1 & 9 crossing	SE3

**REFERENCE NO. 15**

**REFERENCE NO. 16**





CO  
NION

Newark  
18

406h

ELIZABETH

Roselle

APPROX  
SIZE

Elizabeth

ks

LINDEN

Linden

Tanks

inks

431h

WAY

113g

128g

STATEN ISLAND

New D

Car

JERSEY

bridge

PATHWAY

**REFERENCE NO. 17**

Scale 1: 63,360

1 2 0 1 2 3 Kilometers  
1 2 0 1 2 3 Miles

GEORGE HALASI-KUN, TOPOGRAPHIC ENGINEER  
JOHN G. KREMPER, CARTOGRAPHER

WATER SUPPLY OVERLAY  
SHEET 26

LEGEND

- AREA SERVED BY PRIVATE WATER SERVICE COMPANIES
- AREA SERVED BY REGIONALLY OWNED WATER SERVICE COMPANIES
- AREA SERVED BY MUNICIPALLY OWNED WATER SERVICE COMPANIES
- AREA NOT PRESENTLY SERVED BY WATER SERVICE

- PUBLIC SUPPLY WELLS
- SURFACE WATER INTAKE
- MAJOR WATER MAINS
- TOWNSHIP BOUNDARIES
- COUNTY BOUNDARIES
- STATE BOUNDARIES
- ALL MAP COORDINATES ARE FOR THE LOWER LEFT HAND CORNER.

ELIZABETHTOWN  
WATER CO.

CITY OF NEWARK  
WATER DEPT.

3 MILE  
RADIUS

ELIZABETH  
WATER UTILITY

ELIZABETH  
WATER CO.

KEY TO ADJOINING SHEETS

21	22	23
24	25	26
27	28	29
30	31	32
33	34	35

**REFERENCE NO. 18**

GSC-TR8645

GRAPHICAL EXPOSURE MODELING SYSTEM

(GEMS)

USER'S GUIDE

VOLUME 2. MODELING

Prepared for:

U.S. ENVIRONMENTAL PROTECTION AGENCY  
OFFICE OF PESTICIDES AND TOXIC SUBSTANCES  
EXPOSURE EVALUATION DIVISION

Task No. 3-2

Contract No. 68023970

Project Officer: Russell Kinerson

Task Manager: Loren Hall

Prepared by:

GENERAL SCIENCES CORPORATION  
8401 Corporate Drive  
Landover, Maryland 20785

Submitted: December 1, 1986

GEMS> I

ELIZABETH COAL GAS SITE #1

LATITUDE 40:38:49 LONGITUDE 74:11:56 1980 POPULATION

KM	0.00-.400	.400-.810	.810-1.60	1.60-3.20	3.20-4.80	4.80-6.40	SECTOR TOTALS
S 1	1964	5364	24932	42011	77923	119776	271970
RING TOTALS	1964	5364	24932	42011	77923	119776	271970

I

ELIZABETH COAL GAS SITE #1

LATITUDE 40:38:49 LONGITUDE 74:11:56 1980 HOUSING

KM	0.00-.400	.400-.810	.810-1.60	1.60-3.20	3.20-4.80	4.80-6.40	SECTOR TOTALS
S 1	682	1747	8225	15427	29046	41755	96882
RING TOTALS	682	1747	8225	15427	29046	41755	96882

	<i>1/4 mile</i>	<i>1/2 mile</i>	<i>1 mile</i>	<i>2 miles</i>	<i>3 miles</i>	<i>4 miles</i>
POPULATION	1,964	7,328	32,260	74,271	152,194	271,970
HOUSING	682	2,429	10,654	26,081	55,127	96,882

**REFERENCE NO. 19**



## NUS CORPORATION AND SUBSIDIARIES

TELECON NOTE

CONTROL NO.:

02-9004-37

DATE:

5-22-90

TIME:

0925

DISTRIBUTION:

Elizabeth Coal Gas Site #1

BETWEEN:

RAY ZWARYCZ

OF: CITY OF ELIZABETH  
PUBLIC WORKS DEPT.  
ENGINEERING DEPT.

PHONE:

(201) 820-4270

AND:

RICHARD SETTINO

(NUS)

DISCUSSION:

I asked Mr. Zwarycz for Storm Drain information in Elizabeth. He told me that the storm drains in the area do not drain to surface water. Elizabeth has combined sanitary and storm sewers. He said storm water would run off to various catch basins which would send the water to the Pump Station which would then pump it to the Joint Meeting where it would be treated.



ACTION ITEMS:

**REFERENCE NO. 20**



ONE ELIZABETHTOWN PLAZA • ELIZABETH, NEW JERSEY 07207 • (201) 289-5000

September 22, 1983

Mr. Tony Farro, Chief  
Bureau of Site Management  
Department of Environmental Protection  
CN-028  
Trenton, NJ 08625

Dear Mr. Farro:

Enclosed herewith is a copy of the letter of notification  
I recently sent to EPA.

There is a typo on page three, the Washington, DC site should,  
of course, be Washington, NJ.

Very truly yours,

RFJr:B  
Encl.

Russell Fleming, Jr.  
Executive Vice President  
and General Counsel

cc: Edward Putnam  
Site Manager  
Department of Environmental Protection  
CN-028  
Trenton, NJ 08625

Sam Gianti  
Scientific Analyst  
8 E. Hanover St.  
Trenton, NJ 08625



ONE ELIZABETHTOWN PLAZA • ELIZABETH, NEW JERSEY 07207 • (201) 280-5000

September 19, 1983

Hon. William D. Ruckleshaus  
Administrator  
U.S. Environmental Protection Agency  
401 M Street, SW  
Washington, DC 20460

Dear Mr. Ruckleshaus:

Pursuant to the Comprehensive Environmental Response, Compensation and Liability Act, notice is hereby given of the potential existence of substances that may be "hazardous", within the definition reflected in 40 C.F.R. §300.6, on land owned now or in the past by the Elizabethtown Gas Company ("Elizabethtown").

Elizabethtown has become aware that facilities formerly used for the manufacture of low-Btu "town gas" from coal by the gas industry may, as a class, present hazardous waste questions. On August 22, 1983, Elizabethtown received from the New Jersey Department of Environmental Protection ("NJDEP") a request for information on eight properties, which are assumed to be former gas manufacturing facilities, including a designation of the operations thereon and the waste disposal methods utilized at the plants. We understand that NJDEP sent letters requesting information on other similar sites to other New Jersey gas utilities.

Our information at this point is very incomplete and we are gathering more, in cooperation with NJDEP. Activity at some of the sites stopped over 80 years ago and some data may be unavailable. In some cases we do not even know whether coal gasification processes were ever carried on at the site. In several cases, previous owners conducted any activities that may have occurred. In at least four cases Elizabethtown purchased the natural gas properties, directly or indirectly from Jersey Central Power & Light Company ("JCPL").

The sites, together with brief descriptions of coal gasification and related activity, if any, and ownership status, are as follows:

A. Gasification Facilities Formerly Operated and Property Now Owned by Elizabethtown:

1. Erie Street, between Third Avenue and Florida Street, Elizabeth, NJ - Prior to 1911 coal gas was manufactured here by Elizabethtown or a predecessor. After 1911, gas was manufactured from oil ("water gas"). The plant was used regularly until mid-1950, at which time its use was limited to intermediate winter peak shaving purposes. Such use continued through the winter of 1970-71, and the plant was subsequently dismantled. Approximately half of the original site has been sold; Elizabethtown retains the other half, operating facilities that include a system dispatch center and winter peaking supplies (LNG and propane).

2. 406 South Street, Elizabeth, NJ - Not operated since approximately 1901. Prior to that time, there was a coal gasification facility operated by Elizabeth. One half still owned by Elizabethtown; one half condemned and taken for flood control project in 1974.

3. East Main Street, Flemington, NJ - Was operated as a coal gasification plant by Jersey Central Power and Light ("JCPL"), until 1947, at which time it was acquired by a predecessor of Elizabethtown. The plant was abandoned in 1951 with the advent of natural gas.

B. Gasification Facilities Never Operated by Elizabethtown But Property Now Owned by Elizabethtown:

4. Diller Avenue, Newton, NJ - Was operated by JCPL as a coal gasification plant, we believe. A subsequent owner, which was merged into Elizabethtown, operated an oil gasification facility. One half of site now owned by Elizabethtown; JCPL retains the remainder for an electric substation.

C. Gasification Facilities Formerly Operated by Elizabethtown But Property No Longer Owned by Elizabethtown:

5. Linden, Sadowski, Wisteria Streets, Perth Amboy, NJ - Was operated by Elizabethtown as coal gasification plant prior to 1923; no longer owned. A storage holder was removed and property sold to St. Demetrius Greek Orthodox Church in 1964.

6. Intersection Central, Hamilton and Irving Streets, Rahway, NJ - May have been operated as coal gasification plant prior to 1911 by Elizabethtown or a predecessor. No longer owned by Elizabethtown. The land was sold to the City of Rahway in 1972.

D. Uncertain Whether Gasification Facilities Operated Or By Whom; Property No Longer Owned by Elizabethtown:

7. S. Main Street at Ferry Street, Lambertville, NJ - No longer owned by Elizabethtown. Former site of gas storage facilities. Elizabethtown is currently not sure whether gasification activities ever occurred at this site. It is believed there were no gasification activities after 1912. The storage holder was removed and property sold to Econotech Development Corporation of Bridge and Union Streets, Lambertville, in 1978.

8. Heckman Terrace, Phillipsburg, NJ - Owned by Elizabethtown until 1972, formerly owned by JCPL; Elizabethtown does not believe the site ever was the scene of coal gasification processes though it was a storage area. Was sold in 1972 to McGinley Mills Inc.

E. Gasification Facilities Never Operated by Elizabethtown; Property Never Owned by Elizabethtown:

9. S. Lincoln Street, Washington, NJ - May have been a coal gasification site for JCPL or a predecessor around 1870; Elizabethtown and its predecessors never owned this site but a report was made to New Jersey's Board of Public Utilities because the property is within our franchise area.

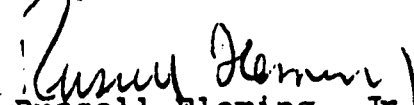
With the exception of number 8, the NJDEP letter referenced all of the sites listed in A through E.

At this point, we have no information concerning the quantity of wastes, if any, that were deposited on these sites. Additionally, we still lack chemical information as to what particular substances may remain at each site. Generically, coal tars were a by-product of coal gas production and purification operations. We do have records of sales of these coal tars to other companies, including Public Service Electric & Gas Company over many years. We assume, thought, that some coal tars have been deposited on some of the sites listed, either by Elizabethtown (or its predecessors) or by Jersey Central Power & Light (or its predecessors) and that some coal tar constituents persist on at least some sites.

Page Four  
September 19, 1983

We are engaged in a thorough search of corporate and other records to determine what activities took place at what locations on these sites. We shall also retain such outside consulting help as may be needed to assist in chemical and engineering evaluation.

Very truly yours,

  
Russell Fleming, Jr.  
Executive Vice President  
and General Counsel

RFJr:B

cc: Hon. Robert E. Hughey, Commissioner  
New Jersey Department of Environmental Protection

Jacqueline E. Schafer  
Administrator, U.S. EPA Region II  
26 Federal Plaza  
Room 900  
New York, NY 10278

Robert Brokaw, Esq.  
Jersey Central Power & Light Co.

---

**REFERENCE NO. 21**



LATITUDE 403823  
LONGITUDE 741236

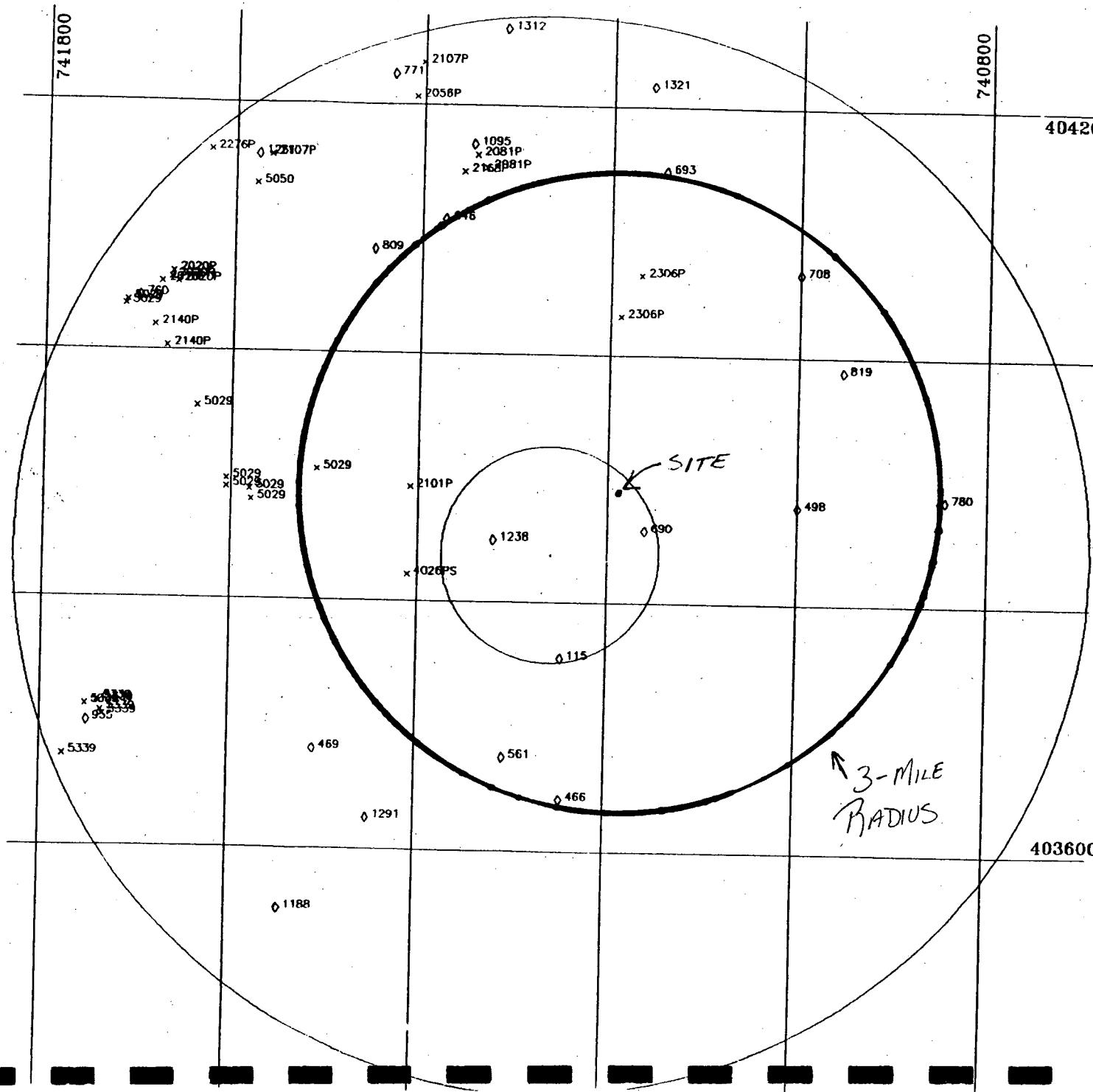
DRAFT

SCALE: 1:63,360  
( $\frac{1}{2}$  Inch = 1 Mile)

\* WATER WITHDRAWAL POINTS  
 O NJGS CASE INDEX SITES  
 1 MILE AND 5 MILE RADII INDICATED

NJGS CASE INDEX DATA RETRIEVED FROM:  
NEW JERSEY GEOLOGICAL SURVEY  
ON 12/22/87

PLOT PRODUCED BY:  
NJDEP  
DIVISION OF WATER RESOURCES  
BUREAU OF WATER ALLOCATION  
CN-029  
TRENTON, NJ 08625  
DATE: 06/25/88



# # - Water withdrawal points within 3 miles of Elizabeth Coal Gas Site #1

Page 1 of PRELIMINARY SURVEY OF WATER WITHDRAWAL POINTS WITHIN 3.0 MILES OF 40°523' LAT., 74°036' LON. (IN ORDER BY DECREASING LONGITUDE) - 06/27/82

NUMBER	NAME	SOURCEID	COORD	LAT	LON	BLADE	DISTANCE	COUNTY	MUN	DEPTH	GEOL	DEED	CAPACITY
5339	RAHWAY, CITY OF	2600795	5	403644	741745		4.9	39	13	245	GTRB		400
5339	RAHWAY, CITY OF	2600724	7	403708	741731		4.5	39	13	76	GTRB		350
5339	RAHWAY, CITY OF	2600361	1	403710	741723		4.4	39	13	50.5	GOGD		300
5339	RAHWAY, CITY OF	2600380	2	403707	741722		4.4	39	13	51.5	GOGD		300
5339	RAHWAY, CITY OF	2601671	4	403705	741721		4.4	39	13	127	GTRB		400
5339	RAHWAY, CITY OF	2601672	5	403703	741720		4.4	39	13	135	GTRB		400
5029	ELIZABETHTOWN WATER COMPANY	4600013	RICHFIELD	404022	741709	F	4.3	39	08	402	GTRB		250
2140P	ELIZABETHTOWN WATER COMPANY	4600014	MUNTON	404024	741708	F	4.3	39	08	502	GTRB		250
2020P	ROTARY PEN CORPORATION	2602601	1	404012	741650		4.3	39	08	405	GTRB		40
2140P	SCHERING CORPORATION	2605849	3	404033	741646		4.4	39	08	502	GTRB		452
2140P	ROTARY PEN CORPORATION	2602631	2	404032	741642		4.1	39	08	402	GTRB		125
2020P	SCHERING CORPORATION	4600076		404035	741640	U	4.4	39	08	467	GTRB		460
2020P	SCHERING CORPORATION	2600438	3	404035	741640	U	4.4	39	08	405	GTRB		400
2020P	SCHERING CORPORATION	2600073	2	404038	741639		4.4	39	08	398	GTRB		400
2020P	SCHERING CORPORATION	2605532	4A	404033	741636		4.3	39	08	550	GTRB		450
5029	ELIZABETHTOWN WATER COMPANY	3601696	FIRST AVE	403933	741622	F	3.6	39	14	509	GTRB		450
2276P	SCHERING CORP.	4600145	2	404137	741616	F	4.9	39	19	676	GTRB		260
5029	ELIZABETHTOWN WATER COMPANY	2602302	WALABURG	403854	741603	F	3.1	39	14	350	GTRB		350
5029	ELIZABETHTOWN WATER COMPANY	2602412	WALABURG	403856	741603	F	3.1	39	14	321	GTRB		360
5029	ELIZABETHTOWN WATER COMPANY	2602463	WALABURG	403853	741548	F	2.9	39	14	325	GTRB		400
5029	ELIZABETHTOWN WATER COMPANY	2602360	WALABURG	403848	741547	F	2.8	39	14	348	GTRB		300
5050	ELIZABETHTOWN WATER COMPANY	4600016	1	404121	741546		4.4	39	19	326	GTRB		120
5050	ELIZABETHTOWN WATER COMPANY	4600017	1A	404121	741546		4.4	39	19	143	GTRB		200
5050	ELIZABETHTOWN WATER COMPANY	4600018	2A	404121	741546		4.4	39	19	120	GTRB		150
5050	ELIZABETHTOWN WATER COMPANY	4600019	3	404121	741546		4.4	39	19	90	GTRB		200
5050	ELIZABETHTOWN WATER COMPANY	4600020	3A	404121	741546		4.4	39	19	129	GTRB		100
5050	ELIZABETHTOWN WATER COMPANY	4600021	4A	404121	741546		4.4	39	19	125	GTRB		100
5050	ELIZABETHTOWN WATER COMPANY	4600022	5	404121	741546		4.4	39	19	91	GTRB		200
5050	ELIZABETHTOWN WATER COMPANY	4600023	5A	404121	741546		4.4	39	19	128	GTRB		150
5050	ELIZABETHTOWN WATER COMPANY	4600024	6A	404121	741546		4.4	39	19	130	GTRB		300
5050	ELIZABETHTOWN WATER COMPANY	4600025	7	404121	741546		4.4	39	19	324	GTRB		150
5050	ELIZABETHTOWN WATER COMPANY	4600026	8A	404121	741546		4.4	39	19	125	GTRB		150
5050	ELIZABETHTOWN WATER COMPANY	4600027	9A	404121	741546		4.4	39	19	125	GTRB		150
5050	ELIZABETHTOWN WATER COMPANY	4600028	10	404121	741546		4.4	39	19	80	GTRB		100
5050	ELIZABETHTOWN WATER COMPANY	4600029	10A	404121	741546		4.4	39	19	116	GTRB		150
5050	ELIZABETHTOWN WATER COMPANY	4600030	11	404121	741546		4.4	39	19	125	GTRB		100
5050	ELIZABETHTOWN WATER COMPANY	4600031	12A	404121	741546		4.4	39	19	122	GTRB		200
5050	ELIZABETHTOWN WATER COMPANY	4600032	13	404121	741546		4.4	39	19	111	GTRB		300
5050	ELIZABETHTOWN WATER COMPANY	4600033	14	404121	741546		4.4	39	19		GTRB		100
5050	ELIZABETHTOWN WATER COMPANY	4600034	23	404121	741546		4.4	39	19	117	GTRB		100
5050	ELIZABETHTOWN WATER COMPANY	4600035	24	404121	741546		4.4	39	19	440	GTRB		100
5050	ELIZABETHTOWN WATER COMPANY	4600036	25	404121	741546		4.4	39	19	96	GTRB		100
5050	ELIZABETHTOWN WATER COMPANY	4600037	26	404121	741546		4.4	39	19	106	GTRB		100
5050	ELIZABETHTOWN WATER COMPANY	4600038	41	404121	741546		4.4	39	19	83	GTRB		150
5050	ELIZABETHTOWN WATER COMPANY	2604808	WTS 2	404121	741546		4.4	39	19	78	GTRB		150
5050	ELIZABETHTOWN WATER COMPANY	2604809	WTS 1	404121	741546		4.4	39	19	110	GTRB		200
5050	ELIZABETHTOWN WATER COMPANY	2604810	WTS 3	404121	741546		4.4	39	19	100	GTRB		200
5050	ELIZABETHTOWN WATER COMPANY	2604826	WHS	404121	741546		4.4	39	19	117	GTRB		400
2107P	TUSCAN DAIRY FARMS INC	2604607	4	404135	741537		4.5	39	19	200	GTRB		400
*5029	ELIZABETHTOWN WATER COMPANY	2602393	CHANNEL	403983	741525	F	2.3	39	14	350	GTRB		300
*4026P	EXXON COMPANY USA	2605855	CR 7	403817	741402	T	1.0	39	05		SV		
2056P	ATLAS TOOL COMPANY, INC.	2601171		404024	741405		4.4	39	02	134	GTRB		500
2056P	ATLAS TOOL COMPANY, INC.	2605879		404024	741405		4.4	39	02	704	GTRB		500
*2107P	DEGRATER PLANT CO. INC.	2604777		403817	741402		1.0	39	05	770	GTRB		700

# \* -- Water withdrawal points within 3 miles of Elizabeth Coal Gas Site #1

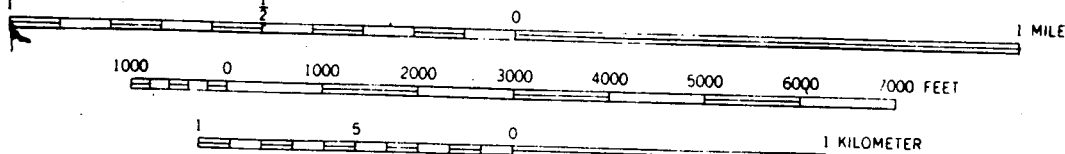
Page 2 of PRELIMINARY SURVEY OF WATER WITHDRAWAL POINTS WITHIN 3 MILES OF 403823 LAT. 741226 LONG. (IN ORDER BY DECREASING LONGITUDE) - 06-75-05

NUMBER	NAME	SOURCEID	LOCID	LAT	LONG	LLACC	DISTANCE	COUNTY	MIN	DEPTH	GEO1	GEO2	CAPACITY
2166P	SECUR-IMAGE TECHNOLOGIES INC.	2603615	2	404122	741334		3.6	39	07	461	GTRB		200
2091P	CERTIFIED PROCESSING CORP.	460074	1	404136	741326	F	3.8	21	07	202	GTRB		100
2081P	CERTIFIED PROCESSING CORP.	2604624	3	404136	741326	F	3.8	21	07	250	GTRB		
2081P	CERTIFIED PROCESSING CORP.	2600265	2	404130	741320	F	3.6	21	07	630	GTRB		250
*2306P	HAYWARD MANUFACTURING PRODUCTS	2604712	1	404019	741154		0.3	39	19	274	GTRB		100
*2306P	HAYWARD MANUFACTURING PRODUCTS	2606667	2	404039	741141		2.7	39	19	275	GTRB		100

Number of Observations: 62

ELIZABETH, N.J.

SCALE 1:24 000



# **NATIONAL WETLANDS INVENTORY** UNITED STATES DEPARTMENT OF THE INTERIOR

Other information concerning the wetland resources depicted on this document may be available. For information, contact:

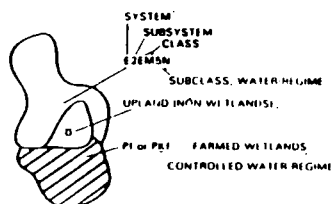
Regional Director (ARDE) Region V  
U.S. Fish and Wildlife Service  
1 Gateway Center, Suite 700  
Newton Corner, Massachusetts 01258

## **SPECIAL NOTE**

This document was prepared primarily by stereoscopic analysis of high altitude aerial photographs. Wetlands were identified on the photographs based on vegetation, visible hydrology, and topography in accordance with Classification of Wetlands and Deep Water Habitats of the United States (An Operational Draft). Cowardin, et al. 1977. The aerial photographs typically reflect conditions during the specific year and season when they were taken. In addition, there is a margin of error inherent in the use of the aerial photographs. Thus, a detailed on the ground and historical analysis of a single site may result in a revision of the wetland boundaries established through photographic interpretation. In addition, some small wetlands and those obscured by dense forest cover may not be included on this document.

Federal, State and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, State or local government or to establish the geographic scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, State or local agencies concerning specific agency regulatory programs and proprietary jurisdictions that may affect such activities.

## **SYMBOLS EXAMPLE**



## **NOTES TO THE USER**

- Wetlands which have been field examined are indicated on the map by an asterisk (\*)
- Dominance type (either vegetative or sedentary animal) can be added to the map by the intended user.
- Additions or corrections to the wetlands information displayed on this map are solicited. Please forward such information to the address indicated.

## **AERIAL PHOTOGRAPHY**

DATE 10 / 29 / 76  
SCALE 1:80000  
TYPE B-W  
DATE   /  /    
TYPE     
DATE   /  /    
TYPE   



**U.S. DEPARTMENT OF THE INTERIOR**

**FISH AND WILDLIFE SERVICE**

Prepared by Office of Biological Services  
for the National Wetlands Inventory

# WETLAND LEGEND

U — Primarily represents upland areas, but may include unclassified wetlands such as man-modified areas, non photo-identifiable areas and/or unintentional omissions.

## ECOLOGICAL SYSTEM

### Ecological Subsystem

#### CLASS

#### Subclass

## E — ESTUARINE

### 1 — Subtidal

### 2 — Intertidal

RS — ROCK BOTTOM	UB — UNCONSOLIDATED BOTTOM	AB — AQUATIC BED	RF — REEF	OW — OPEN WATER: Unknown Bottom	AB — AQUATIC BED	RF — REEF	FL — FLAT	SB — STREAMBED	RS — ROCKY SHORE	BB — BEACH/BAR	EM — EMERGENT	SS — SCRUB/SHRUB	FO — FORESTED
1 Bedrock 2 Boulder	1 Cobble/Gravel 2 Sand 3 Mud 4 Organic	1 Submersed Algal 2 Submersed Vascular 3 Floating-leaved 4 Floating 5 Unknown Submersed 7 Unknown Surface	2 Mollusc 3 Worm		1 Submersed Algal 2 Submersed Vascular 3 Unknown Submersed 7 Unknown Surface	2 Mollusc 3 Worm	1 Cobble/Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated Pioneer 6 Vegetated Non-pioneer	1 Cobble/Gravel 2 Sand 3 Mud 4 Organic	1 Bedrock 2 Boulder 3 Vegetated 6 Non-pioneer	1 Cobble/Gravel 2 Sand	1 Persistent 2 Nonpersistent 3 Narrow-leaved Nonpersistent 4 Broad-leaved Nonpersistent 5 Narrow-leaved Persistent 6 Broad-leaved Persistent	1 Broad-leaved Deciduous 2 Broad-leaved Evergreen 3 Needle-leaved Evergreen 4 Dead 5 Deciduous 7 Evergreen	1 Broad-leaved Deciduous 2 Broad-leaved Evergreen 3 Needle-leaved Evergreen 4 Dead 5 Deciduous 7 Evergreen

## ECOLOGICAL SYSTEM

### No Subsystem

#### CLASS

#### Subclass

## P — PALUSTRINE

RS — ROCK BOTTOM	UB — UNCONSOLIDATED BOTTOM	AB — AQUATIC BED	FL — FLAT	ML — MOSS/LICHEN	EM — EMERGENT	SS — SCRUB/SHRUB	FO — FORESTED	OW — OPEN WATER: Unknown Bottom
1 Bedrock 2 Boulder	1 Cobble/Gravel 2 Sand 3 Mud 4 Organic	1 Submersed Algal 2 Submersed Vascular 3 Submersed Films 4 Floating-leaved 5 Floating 6 Unknown Submersed 7 Unknown Surface	1 Cobble/Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated Pioneer 6 Vegetated Non-pioneer	1 Moss 2 Lichen	1 Persistent 2 Nonpersistent 3 Narrow-leaved Nonpersistent 4 Broad-leaved Nonpersistent 5 Narrow-leaved Persistent 6 Broad-leaved Persistent	1 Broad-leaved Deciduous 2 Needle-leaved Deciduous 3 Broad-leaved Evergreen 4 Needle-leaved Evergreen 5 Dead 6 Deciduous 7 Evergreen	1 Broad-leaved Deciduous 2 Needle-leaved Deciduous 3 Broad-leaved Evergreen 4 Needle-leaved Evergreen 5 Dead 6 Deciduous 7 Evergreen	

## ECOLOGICAL SYSTEM

### Ecological Subsystem

#### CLASS

#### Subclass

## R — RIVERINE

### 1 — Tidal

### 2 — Lower Perennial

### 3 — Upper Perennial

### 4 — Intermittent

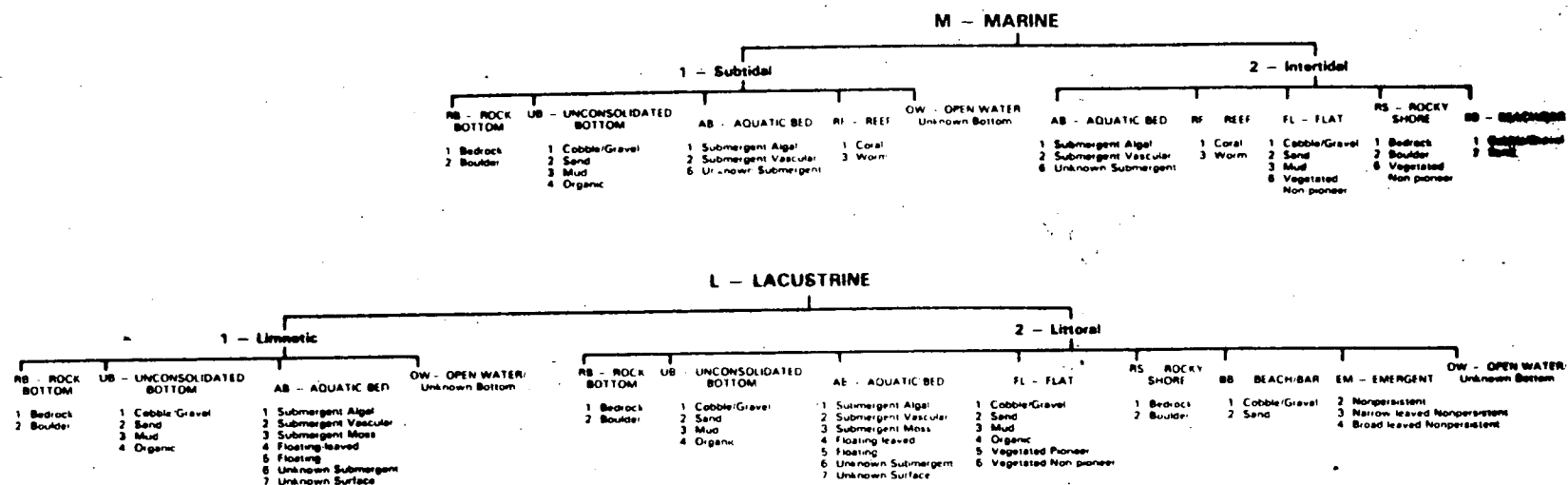
### 5 — Unknown Perennial

EM — EMERGENT (1)	RS — ROCKY SHORE	UB — UNCONSOLIDATED BOTTOM	AB — AQUATIC BED	FL — FLAT	SB — STREAMBED	RS — ROCKY SHORE	BB — BEACH/BAR	OW — OPEN WATER: Unknown Bottom
2 Nonpersistent 3 Narrow-leaved Nonpersistent 4 Broad-leaved Nonpersistent	1 Bedrock 2 Boulder	1 Cobble/Gravel 2 Sand 3 Mud 4 Organic	1 Submersed Algal 2 Submersed Vascular 3 Submersed Films 4 Floating-leaved 5 Floating 6 Unknown Submersed 7 Unknown Surface	1 Cobble/Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated Pioneer 6 Vegetated Non-pioneer	1 Cobble/Gravel 2 Sand 3 Mud 4 Organic	1 Bedrock 2 Boulder	1 Cobble/Gravel 2 Sand	

(1) EM — EMERGENTS are only found in the Riverine Tidal and Riverine Lower Perennial Ecological Subsystem. All other classes are found in all Riverine Ecological Subsystems.

# WETLAND LEGEND

U — Primarily represents upland areas, but may include unclassified wetlands such as man-modified areas, non photo-identifiable areas and/or unintentional omissions.



## DESCRIPTION OF WATER WITHDRAWAL POINTS

The Water Withdrawal Points listing contains the following fields:

CAPACITY: the pump capacity in gallons per minute  
COUNTY: county the withdrawal point is in  
DEPTH: depth of the well or pond  
DISTANCE: distance in miles from center of circle  
GEO1: the ground or surface water source  
GEO2: a secondary source of the water  
LAT: latitude of the withdrawal point  
LLACC: accuracy of the latitude and longitude estimates  
LOCID: the local identification of the withdrawal point,  
or a continuation of the SOURCEID field for surface water  
LON: longitude of the withdrawal point  
MUN: the municipality the withdrawal point is in  
NAME: name of the permit, certificate, or registration holder  
NUMBER: Water Allocation permit, Agricultural Certification, or  
Registration number  
SOURCEID: the well permit number or other identifier for  
the water withdrawal

The listing that you have requested includes most wells and surface intakes that are in the Water Allocation Permits, and representative sources from most of the Agricultural Certificates. Recognizing the fact that the list will contain errors and omissions, it is advisable to use this resource as a guide and to verify all data. We try to maintain an accurate database; however, we can not yet guarantee reliability. If you spot any errors we would be very grateful to hear about them. Please call or write to us in reference to the "Radius Program" at:

NJDEP  
Division of Water Resources  
Bureau of Water Allocation  
CN-029  
Trenton, NJ 08625

(609) 292-2957

Thank you.

Please see the attached sheets for definitions of the codes used in the Water Withdrawal Points listing.



## CODES USED IN THE WATER WITHDRAWAL POINTS LISTING

This packet contains information on the database codes that the Bureau of Water Allocation uses in the Water Withdrawal Points Listing.

COUNTY:	01 - Atlantic	15 - Gloucester	29 - Ocean
	03 - Bergen	17 - Hudson	31 - Passaic
	05 - Burlington	19 - Hunterdon	33 - Salem
	07 - Camden	21 - Mercer	35 - Somerset
	09 - Cape May	23 - Middlesex	37 - Sussex
	11 - Cumberland	25 - Monmouth	39 - Union
	13 - Essex	27 - Morris	41 - Warren

GEO:	RECENT	
	Surficial Deposits	GRS
	PLEISTOCENE	
	Glacial Undifferentiated	GQGU
	Stratified Drift	GQSD
	Terminal Moraine	GQTM
	Bridgeton	GQBS
	Cape May	GQCM
	Holly Beach Mbr.	GQCHB
	Estuarine Sand	GQES
	Pennsauken	GQPS
	TERTIARY	
	Beacon Hill	GTBH
	Cohansey	GTCH
	Cohansey & Kirkwood	GTCK
	Kirkwood	GTKW
	Upper	GTKWU
	Rio Grande	GTKRG
	Lower	GTKWL
	Piney Point Mbr.	GTKPP
	Shark River Marl	GTSR
	Manasquan Marl	GTMQ
	Vincentown Sand	GTVT
	Hornerstown Marl	GTHT
	CRETACEOUS	
	Red Bank	GKRB
	Navesink	GKNS
	Mount Laurel	GKML
	Wenonah	GKWE
	Mount Laurel & Wenonah	GKMW
	Marshalltown	GKMT
	Englishtown	GKET
	Woodbury	GKWB
	Merchantville	GKMV
	Magothy	GKM

Old Bridge	GKROB
Raritan	GKR
Sayreville Sand	GKRSS
Farrington	GKRF
Raritan/Magothy	GKMR
Potomac	GKP
TRIASSIC	
Brunswick Formation	GTRB
Lockatong Formation	GTRL
Stockton Formation	GTRS
Basalt	GTRBS
Diabase	GTRDB
Conglomerate	GTRCG
DEVONIAN	
Undifferentiated	GD
SILURIAN	
Bossardville Limestone	GSBD
Decker Formation	GSDK
Longwood Shale	GSLS
Poxono Island Fm	GSPI
Greenpond Conglomerate	GSGP
High Falls	GSHF
Shawangunk Fm	GSSG
ORDOVICIAN	
Martinsburg Fm	GOMB
Jacksonburg Fm	GOJB
Kittatinny Group	GOK
Outleaunee Fm	GOKO
Harmonyvale Mbr	GOKOH
Beaver Run Mbr	GOKOB
Epler	GOKE
Rickenbach	GOKR
CAMBRO ORDOVICIAN	
Kittatinny Fm	GCOK
CAMBRIAN	
Hardyston Quartzite	GCH
Allentown Fm	GCKA
Upper Mbr	GCKU
Limeport Mbr	GCKLP
Leithsville Fm	GCKL
Walkill Mbr	GCKLW
Hamburg Mbr	GCKLH
Califon Mbr	GCKLC
PRECAMBRIAN	
Granite	GPCGR
Gneiss	GPCGN
Undifferentiated	GPC

# Franklin Lms

## GPCFL

### DELAWARE RIVER BASIN

Unknown or Non-Specific

Alloways Creek  
 Alexsocken Creek  
 Assiscunk Creek  
 Assunpink Creek  
 Big Timber Creek  
 Blacks Creek  
 Cooper's Creek  
 Crafts Creek  
 Crosswicks Creek  
 Delaware River  
 Flat Brook  
 Hakiwokake Creek  
 Hariwokake Creek  
 Jacob's Creek  
 Lockatong Creek  
 Lopatcong Creek  
 Mantua Creek  
 Musconetcong River  
 Nichisakawick Creek  
 Old Man's Creek  
 Paulins Kill  
 Pennsauken Creek  
 Pequest River  
 Pohatcong Creek  
 Raccoon Creek  
 Rancocas Creek  
 Salem River  
 Wickecheoke Creek

SD  
 SDALL  
 SDALE  
 SDASC  
 SDASP  
 SDBIG  
 SDBLA  
 SDCOO  
 SDCRA  
 SDCRO  
 SDDDEL  
 SDFLA  
 SDHAK  
 SDHAR  
 SDJAC  
 SDLOC  
 SDLOP  
 SDMNT  
 SDMUS  
 SDNIC  
 SDOLD  
 SDPAU  
 SDPEN  
 SDPST  
 SDPOH  
 SDRAC  
 SDRAN  
 SDSAL  
 SDWIC

### RARITAN RIVER BASIN

Unknown or Non-Specific

Lawrence Brook  
 Lower Raritan  
 Millstone River  
 North Branch Raritan  
 South Branch Raritan  
 South River

SR  
 SRLAW  
 SRLAW  
 SRMIL  
 SRNBR  
 SRSBR  
 SRSRV

### PASSAIC RIVER BASIN

Unknown or Non-Specific

Canoe Brook  
 Lower Mid-Passaic River  
 Lower Passaic  
 Passaic River  
 Peckman River  
 Pequannock River  
 Pompton River  
 Ramapo River  
 Rockaway River  
 Saddle River

SP  
 SPCAN  
 SPLMP  
 SPLPW  
 SPPAS  
 SPPEC  
 SPPNK  
 SPPOM  
 SPRAM  
 SPROC  
 SPSAD

Upper Mid-Passaic River	SPUMP
Upper Passaic River	SPUPP
Wanaque River	SPWAN
Whippany River	SPWHI

#### ATLANTIC COASTAL BASIN

Unknown or Non-Specific	SC
Atlantic County Coastal	SCATL
Cape May County Coastal	SCCAP
Cedar Creek	SCCED
Great Egg Harbor River	SCGRE
Manasquan River	SCMSQ
Metedeconk River	SCMET
Monmouth County Coastal	SCMON
Mullica River	SCMUL
Navesink River	SCNAV
Ocean County Coastal	SCOCE
Raritan Bay	SCRAR
Shark River	SCSHA
Shrewsbury River	SCSHR
Toms River	SCTOM
Tuckahoe River	SCTUC

#### HUDSON RIVER BASIN

Unknown or Non-Specific	SH
Hudson River	SHHUD
Papakating Creek	SHPAP
Pochuck Creek	SHPOC
Wallkill River	SHWAL

#### HACKENSACK RIVER BASIN

Unknown or Non-Specific	SK
Hackensack River	SKHAC

#### RAHWAY RIVER BASIN

Unknown or Non-Specific	SY
Rahway River	SYRAH

#### ELIZABETH RIVER BASIN

Unknown or Non-Specific	SE
Elizabeth River	SEELI

#### DELAWARE BAY BASIN

Unknown or Non-Specific	SB
Cohansey River	SBCOH
Maurice River	SBMAU
Stow Creek	SBSTO

#### LLACC:

S	- accurate to +- 1 second
F	- accurate to +- 5 seconds
T	- accurate to +- 10 seconds
M	- accurate to +- 1 minute
U	- accuracy unknown

**MUN: ATLANTIC COUNTY (01)**

01 - Absecon City  
03 - Brigantine City  
05 - Buena Vista Twp  
07 - Egg Harbor City  
09 - Estell Manor City  
11 - Galloway Twp  
13 - Hammonton Town  
15 - Longport Boro  
17 - Mullica Twp  
19 - Pleasantville City  
21 - Somers Point City  
23 - Weymouth Twp

02 - Atlantic City  
04 - Buena Boro  
06 - Corbin City  
08 - Egg Harbor Twp  
10 - Folsom Boro  
12 - Hamilton Twp  
14 - Linwood City  
16 - Margate City  
18 - Northfield City  
20 - Port Republic City  
22 - Ventnor City

**BERGEN COUNTY (03)**

01 - Allendale Boro  
03 - Bergenfield Boro  
05 - Carlstadt Boro  
07 - Closter Boro  
09 - Demarest Boro  
12 - East Rutherford Boro  
11 - Elmwood Park Boro  
15 - Englewood City  
17 - Fair Lawn Boro  
19 - Fort Lee Boro  
21 - Garfield Boro  
23 - Hackensack City  
25 - Hasbrouck Heights Boro  
27 - Hillsdale Boro  
29 - Leonia Boro  
31 - Lodi Boro  
33 - Mahwah Twp  
35 - Midland Park Boro  
37 - Moonachie Boro  
39 - North Arlington Boro  
41 - Norwood Boro  
43 - Old Tappan Boro  
45 - Palisades Park Boro  
47 - Park Ridge Boro  
49 - Ridgely Boro  
51 - Ridgewood Village  
53 - River Vale Twp  
55 - Rockleigh Boro  
57 - Saddle Brook Twp  
59 - South Hackensack Twp  
61 - Tenafly Boro  
63 - Upper Saddle River Boro  
65 - Wallington Boro  
67 - Westwood Boro  
69 - Woodcliff Lake Boro

02 - Alpine Boro  
04 - Bogota Boro  
06 - Cliffside Park Boro  
08 - Cresskill Boro  
10 - Dumont Boro  
13 - Edgewater Boro  
14 - Emerson Boro  
16 - Englewood Cliffs Boro  
18 - Fairview Boro  
20 - Franklin Lakes Boro  
22 - Glen Rock Boro  
24 - Harrington Park Boro  
26 - Haworth Boro  
28 - Hohokus Boro  
30 - Little Ferry Boro  
32 - Lyndhurst Twp  
34 - Maywood Boro  
36 - Montvale Boro  
38 - New Milford Boro  
40 - Northvale Boro  
42 - Oakland Boro  
44 - Oradell Boro  
46 - Paramus Boro  
48 - Ramsey Boro  
50 - Ridgely Park Village  
52 - River Edge Boro  
54 - Rochelle Park Twp  
56 - Rutherford Boro  
58 - Saddle River Boro  
60 - Teaneck Twp  
62 - Teterboro Boro  
64 - Waldwick Boro  
66 - Washington Twp  
68 - Wood-Ridge Boro  
70 - Wyckoff Twp

**BURLINGTON COUNTY (05)**

01 - Bass River Twp  
03 - Bordentown City

02 - Beverly City  
04 - Bordentown Twp

- 05 - Burlington City
- 07 - Chesterfield Twp
- 09 - Delanco Twp
- 11 - Eastampton Twp
- 13 - Evesham Twp
- 15 - Florence Twp
- 17 - Lumberton Twp
- 19 - Maple Shade Twp
- 21 - Medford Twp
- 23 - Mount Holly Twp
- 25 - New Hanover Twp
- 27 - Palmyra Boro
- 29 - Pemberton Twp
- 31 - Riverton Boro
- 33 - Southampton Twp
- 35 - Tabernacle Twp
- 37 - Westampton Twp
- 39 - Woodland Twp

CAMDEN COUNTY (07)

- 01 - Audubon Boro
- 03 - Barrington Boro
- 05 - Berlin Boro
- 07 - Brooklawn Boro
- 09 - Cherry Hill Twp
- 11 - Clementon Boro
- 13 - Gibbsboro Boro
- 15 - Gloucester Twp
- 16 - Haddon Twp
- 19 - Hi-Nella Boro
- 21 - Lawnside Boro
- 23 - Magnolia Boro
- 25 - Mount Ephraim Boro
- 27 - Pennsauken Twp
- 29 - Pine Valley Boro
- 31 - Somerdale Boro
- 33 - Tavistock Boro
- 35 - Waterford Twp
- 37 - Woodlynne Boro

CAPE MAY COUNTY (09)

- 01 - Avalon Boro
- 03 - Cape May Point Boro
- 05 - Lower Twp
- 07 - North Wildwood City
- 09 - Sea Isle City
- 11 - Upper Twp
- 13 - West Wildwood Boro
- 15 - Wildwood Crest Boro

CUMBERLAND COUNTY (11)

- 01 - Bridgeton City
- 03 - Deerfield Twp
- 05 - Fairfield Twp

- 06 - Burlington Twp
- 08 - Cinnaminson Twp
- 10 - Delran Twp
- 12 - Edgewater Park Twp
- 14 - Fieldsboro Boro
- 16 - Hainesport Twp
- 18 - Mansfield Twp
- 20 - Medford Lakes Boro
- 22 - Moorestown Twp
- 24 - Mount Laurel Twp
- 26 - North Hanover Twp
- 28 - Pemberton Boro
- 30 - Riverside Twp
- 32 - Shamong Twp
- 34 - Springfield Twp
- 36 - Washington Twp
- 38 - Willingboro Twp
- 40 - Wrightstown

- 02 - Audubon Park Boro
- 04 - Bellmawr Boro
- 06 - Berlin Twp
- 08 - Camden City
- 10 - Chesilhurst Boro
- 12 - Collingswood Boro
- 14 - Gloucester City
- 18 - Haddon Heights Boro
- 17 - Haddonfield Boro
- 20 - Laurel Springs Boro
- 22 - Lindenwold Boro
- 24 - Merchantville Boro
- 26 - Oaklyn Boro
- 28 - Pine Hill Boro
- 30 - Runnemede Boro
- 32 - Stratford Boro
- 34 - Voorhees Twp
- 36 - Winslow Twp

- 02 - Cape May City
- 04 - Dennis Twp
- 06 - Middle Twp
- 08 - Ocean City
- 10 - Stone Harbor Boro
- 12 - West Cape May Boro
- 14 - Wildwood City
- 16 - Woodbine Boro

- 02 - Commercial Twp
- 04 - Downe Twp
- 06 - Greenwich Twp

- 07 - Hopewell Twp
- 09 - Maurice River Twp
- 11 - Shiloh Boro
- 13 - Upper Deerfield Twp

- 08 - Lawrence Twp
- 10 - Millville City
- 12 - Stow Creek Twp
- 14 - Vineland City

ESSEX COUNTY (13)

- 01 - Belleville Town
- 03 - Caldwell Boro
- 05 - East Orange City
- 07 - Fairfield Boro
- 09 - Irvington Town
- 11 - Maplewood Twp
- 13 - Montclair Town
- 15 - North Caldwell Boro
- 17 - Orange City
- 19 - South Orange Village
- 21 - West Caldwell Boro

- 02 - Bloomfield Town
- 04 - Cedar Grove Twp
- 06 - Essex Fells Boro
- 08 - Glen Ridge Boro
- 10 - Livingston Twp
- 12 - Millburn Twp
- 14 - Newark City
- 16 - Nutley Town
- 18 - Roseland Boro
- 20 - Verona Boro
- 22 - West Orange Town

GLOUCESTER COUNTY (15)

- 01 - Clayton Boro
- 03 - East Greenwich Twp
- 05 - Franklin Twp
- 07 - Greenwich Twp
- 09 - Logan Twp
- 11 - Monroe Twp
- 13 - Newfield Boro
- 15 - Pitman Boro
- 17 - Swedesboro Boro
- 19 - Wenonah Boro
- 21 - Westville Boro
- 23 - Woodbury Heights Boro

- 02 - Deptford Twp
- 04 - Elk Twp
- 06 - Glassboro Boro
- 08 - Harrison Twp
- 10 - Mantua Twp
- 12 - National Park Boro
- 14 - Paulsboro Boro
- 16 - South Harrison Twp
- 18 - Washington Twp
- 20 - West Deptford Twp
- 22 - Woodbury City
- 24 - Woolwich Twp

HUDSON COUNTY (17)

- 01 - Bayonne City
- 03 - Guttenberg Town
- 05 - Hoboken City
- 07 - Kearny Town
- 09 - Secaucus Twp
- 11 - Weehawken Twp

- 02 - East Newark Boro
- 04 - Harrison Town
- 06 - Jersey City
- 08 - North Bergen Twp
- 10 - Union City
- 12 - West New York Town

HUNTERDON COUNTY (19)

- 01 - Alexandria Twp
- 03 - Bloomsbury Boro
- 05 - Clinton Town
- 07 - Delaware Twp
- 09 - Flemington Boro
- 11 - Frenchtown Boro
- 13 - Hampton Boro
- 15 - Holland Twp
- 17 - Lambertville City
- 19 - Lebanon Twp
- 21 - Raritan Twp
- 23 - Stockton Boro
- 25 - Union Twp

- 02 - Bethlehem Twp
- 04 - Califon Boro
- 06 - Clinton Twp
- 08 - East Amwell Twp
- 10 - Franklin Twp
- 12 - Glen Gardner Boro
- 14 - High Bridge Boro
- 16 - Kingwood Twp
- 18 - Lebanon Boro
- 20 - Milford Boro
- 22 - Readington Twp
- 24 - Tewksbury Twp
- 26 - West Amwell Twp

MERCER COUNTY (21)

01 - East Windsor Twp  
03 - Hamilton Twp  
05 - Hopewell Boro  
07 - Lawrence Twp  
09 - Princeton Boro  
11 - Trenton City  
13 - West Windsor Twp

02 - Ewing Twp  
04 - Hightstown Boro  
06 - Hopewell Twp  
08 - Pennington Boro  
10 - Princeton Twp  
12 - Washington Twp

MIDDLESEX COUNTY (23)

01 - Carteret Boro  
03 - Dunellen Boro  
05 - Edison Twp  
07 - Highland Park Boro  
10 - Metuchen Boro  
12 - Milltown Boro  
14 - New Brunswick City  
09 - Old Bridge Twp  
17 - Piscataway Twp  
19 - Sayreville Boro  
21 - South Brunswick Twp  
23 - South River Boro  
25 - Woodbridge Twp

02 - Cranbury Twp  
04 - East Brunswick Twp  
06 - Helmetta Boro  
08 - Jamesburg Boro  
11 - Middlesex Boro  
13 - Monroe Twp  
15 - North Brunswick Twp  
16 - Perth Amboy City  
18 - Plainsboro Twp  
20 - South Amboy City  
22 - South Plainfield Boro  
24 - Spotswood Boro

MONMOUTH COUNTY (25)

30 - Aberdeen Twp  
02 - Allentown Boro  
04 - Atlantic Highlands Boro  
06 - Belmar Boro  
08 - Brielle Boro  
10 - Deal Boro  
12 - Englishtown Boro  
14 - Farmingdale Boro  
16 - Freehold Twp  
17 - Highland Boro  
19 - Howell Twp  
21 - Keansburg Boro  
23 - Little Silver Boro  
25 - Long Branch City  
27 - Manasquan Boro  
29 - Matawan Boro  
32 - Millstone Twp  
35 - Neptune City Boro  
37 - Ocean Twp  
40 - Red Bank Boro  
42 - Rumson Boro  
44 - Sea Girt Boro  
46 - Shrewsbury Twp  
48 - Spring Lake Boro  
36 - Tinton Falls Boro  
51 - Upper Freehold Twp  
53 - West Long Branch Twp

01 - Allenhurst Boro  
03 - Asbury Park City  
05 - Avon-By-The-Sea Boro  
07 - Bradley Beach Boro  
09 - Colts Neck Twp  
11 - Eatontown Boro  
13 - Fair Haven Boro  
15 - Freehold Boro  
39 - Hazlet Twp  
18 - Holmdel Boro  
20 - Interlaken Boro  
22 - Keyport Boro  
24 - Loch Arbour Village  
26 - Manalapan Twp  
28 - Marlboro Twp  
31 - Middletown Twp  
33 - Monmouth Beach Boro  
34 - Neptune Twp  
38 - Oceanport Boro  
41 - Roosevelt Boro  
43 - Sea Bright Boro  
45 - Shrewsbury Boro  
47 - South Belmar Boro  
49 - Spring Lake Heights Boro  
50 - Union Beach Boro  
52 - Wall Twp



**REFERENCE NO. 22**

Date: \_\_\_\_\_  
Company: \_\_\_\_\_  
By: \_\_\_\_\_  
Date: \_\_\_\_\_  
Contractor: \_\_\_\_\_  
By: \_\_\_\_\_  
Date: \_\_\_\_\_

USE DOC. 36-1032 (Rev. 1-23-64) & 15-201  
BILLING CODE 1500-50-MIA

(OW-FRL-2460-3)

**Brunswick Shale and Sandstone-  
Aquifer of the Ridgewood Area, New  
Jersey; Final Determination**

**AGENCY:** U.S. Environmental Protection  
Agency.

**ACTION:** Notice.

**SUMMARY:** Pursuant to Section 1424(e) of the Safe Drinking Water Act, the Administrator of the U.S. Environmental Protection Agency (EPA), has determined that the Brunswick Shale and Sandstone Aquifer, underlying the Ridgewood Area, is the sole or principal source of drinking water for Ridgewood, Midland Park, Glen Rock, and Wyckoff, New Jersey, and that the aquifer, if contaminated, would create a significant hazard to public health. As a result of this action, Federal financially assisted projects constructed in the Ridgewood Area and its streamflow source zone (upstream portions of Ho Ho Kus Brook and Saddle River Run drainage basins) will be subject to EPA review to ensure that these projects are designed and constructed so that they do not create a significant hazard to public health.

**ADDRESSES:** The data on which these findings are based are available to the public and may be inspected during normal business hours at the U.S. Environmental Protection Agency, Water Supply Branch, 25 Federal Plaza, New York, New York 10273.

**FOR FURTHER INFORMATION CONTACT:** Damina J. Duda, Water Supply Branch, 25 Federal Plaza, New York, New York 10273 (212) 264-1800.

**SUPPLEMENTARY INFORMATION:** Notice is hereby given that pursuant to Section 1424(e) of the Safe Drinking Water Act (42 U.S.C., 300f, 300h-3(e), Pub. L. 93-523), the Administrator of the U.S. Environmental Protection Agency (EPA) has determined that the Brunswick Shale and Sandstone aquifer of the Ridgewood Area is the sole or principal source of drinking water for Ridgewood, Midland Park, Glen Rock, and Wyckoff, New Jersey. Pursuant to Section 1424(e), Federal financially assisted projects constructed in the Ridgewood Area and its streamflow source zone (upstream portions of Ho Ho Kus Brook, and

Saddle River Run drainage basins) will be subject to EPA review.

### I. Background

Section 1424(e) of the Safe Drinking Water Act states:

(e) If the Administrator determines on his own initiative or upon petition, that an area has an aquifer which is the sole or principal drinking water source for the area and which, if contaminated, would create a significant hazard to public health, he shall publish notice of that determination in the Federal Register. After the publication of any such notice, no commitment for Federal financial assistance (through a grant, contract, loan guarantee, or otherwise) may be entered into for any project which the Administrator determines may contaminate such aquifer through a recharge zone so as to create a significant hazard to public health, but a commitment for Federal financial assistance may, if authorized under another provision of law, be entered into to plan or design the project to assure that it will not so contaminate the aquifer.

On July 4, 1979, the Committee to Keep Our Water Pure petitioned EPA to designate the Brunswick Shale and Sandstone Aquifer of the Ridgewood Area as sole source aquifer. On January 15, 1980, EPA published a notice in the Federal Register announcing a public comment period and setting a public hearing date. A public hearing was conducted on February 23, 1980, and the public was allowed to submit comments on the petition until March 23, 1980.

### II. Basis for Determination

Among the factors to be considered by the Administrator in connection with the designation of an area under Section 1424(e) are: (1) Whether the aquifer is the area's sole or principal source of drinking water, and (2) whether contamination of the aquifer would create a significant hazard to public health.

On the basis of information available to this Agency, the Administrator has made the following findings, which are the basis for the determination noted above:

1. The Brunswick Shale and Sandstone Aquifer of the Ridgewood Area is the "sole source" of drinking water for the approximately 68,820 residents of Ridgewood, Midland Park, Glen Rock, and Wyckoff, New Jersey.

2. There is no existing alternative drinking water source or combination of sources which provides fifty percent or more of the drinking water to the designated area.

3. The Brunswick formation is a soft red shale interbedded with coarse grained sandstone. The aquifer is overlain by permeable unconsolidated glacial and recent deposits. As a result

of permeable soil characteristics, the Brunswick Shale and Sandstone Aquifer of the Ridgewood Area is highly susceptible to contamination through its recharge zone from a number of sources, including but not limited to: chemical spills, leachate from landfills, stormwater runoff, highway deicers, faulty septic systems, wastewater treatment systems, and waste disposal lagoons. The aquifer is also susceptible to contamination to a lesser degree from the same sources, through its streamflow source zone. Since ground water contamination can be difficult or impossible to reverse and since the aquifer in this area is solely relied upon for drinking water purposes by the population of the Ridgewood Area, contamination of the aquifer could pose a significant hazard to public health.

### III. Description of the Brunswick Shale and Sandstone Aquifer of the Ridgewood Area, Its Recharge Zone and Its Streamflow Source Zone

The Brunswick Shale and Sandstone Aquifer is a soft red shale interbedded with coarse grained sandstone. The formation, located in northern New Jersey, is fairly large, extending south into Pennsylvania and north into New York. Igneous intrusions which form the Watchung Mountains and the Palisades, also form the western and eastern boundaries of the Brunswick formation. The area in which Federal financially assisted projects will be subject to review is the portion of the Brunswick Shale and Sandstone Aquifer in the Ridgewood Area, its streamflow source zone, and its recharge zone.

For the purposes of this designation, the Brunswick Shale and Sandstone Aquifer of the Ridgewood Area is considered to include the entire municipalities of Ridgewood, Midland Park, Glen Rock, and Wyckoff, New Jersey. Its recharge zone is considered to be one and the same with this area. The streamflow source zone is that portion of the drainage basins of Ho Ho Kus Brook and Saddle River Run located upstream of the Ridgewood area. This includes all or a portion of the following New Jersey municipalities: Waldwick, Allendale, Ramsey, Manwan, Franklin Lakes, Ho Ho Kus, Saddle River, Upper Saddle River, Woodcliff Lake, Hillside, Washington, Montvale, as well as Ramapo Township, New York.

### IV. Information Utilized in Determination

The information utilized in this determination includes the petition, written and verbal comments submitted by the public, and various technical publications. The above data is

available to the public and may be inspected during normal business hours at the U.S. Environmental Protection Agency, Region II, Water Supply Branch, 25 Federal Plaza, New York, New York 10278.

### V. Project Review

EPA Region II is working with the Federal agencies that may in the future provide financial assistance to projects in the area of concern. Interagency procedures have been developed through which EPA will be notified of proposed commitments by Federal agencies for projects which could contaminate the Brunswick Shale and Sandstone Aquifer, upon which the Ridgewood Area is dependent for its sole source water supply. EPA will evaluate such projects and, where necessary, conduct an in-depth review, including soliciting public comments where appropriate. Should the Administrator determine that a project may contaminate the aquifer through its recharge zone so as to create a significant hazard to public health, no commitment for Federal financial assistance may be entered into. However, a commitment for Federal financial assistance may, if authorized under another provision of law, be entered into to plan or design the project to assure that it will not so contaminate the aquifer.

Although the project review process cannot be delegated, the U.S. Environmental Protection Agency will rely to the maximum extent possible on any existing or future State and local control mechanisms to protect the ground water quality of the Brunswick Shale and Sandstone Aquifer on which the Ridgewood Area is dependent for its sole source water supply. Included in the review of any Federal financially assisted project will be coordination with the State and local agencies. Their comments will be given full consideration and the Federal review process will attempt to complement and support State and local ground water protection mechanisms.

### VI. Summary and Discussion of Public Comments

Most comments were generally in favor of designation. Two local governments submitted resolutions in support of designation. Only two commenters expressed any reservations regarding the designation.

One commenter expressed concern that the proposed designation would provide protection which is duplicative of State and local controls and may lead to unnecessary bureaucratic delays of

projects. Although a number of ground water protection measures are available at the Federal, State and local level, none of these, either individually or collectively, permit EPA to act as directly as would a sole source designation in the review and approval of Federal financially assisted projects. In addition, EPA feels that the sole source project review process will foster integration rather than duplication of environmental review efforts. Memoranda of Understanding have been negotiated with various Federal agencies, with the purpose of streamlining the review process and minimizing project delays.

One commenter expressed concern that the area proposed for sole source designation could be an arbitrary political subdivision of the larger Brunswick aquifer system. The commenter questioned whether sufficient consideration had been given to the physical limits of the hydrologic system. The EPA recognizes that the aquifer does indeed cover a large area. However, a significant portion of the population in these other areas utilize other sources of water supply or have alternative sources available.

Concern was also raised that the Ridgewood Area may have alternative water supply available through adjacent water purveyors; specifically, the Passaic Valley Water Commission or the Hackensack Water Company. EPA has reviewed this matter and determined that either insufficient supply is currently available (in one case) or interconnections between the Ridgewood Area and the purveyor are currently not adequate to handle the Area's demand. Furthermore, the Brunswick Shale and Sandstone Aquifer in the Ridgewood Area is a source of water for export to adjacent purveyors during drought conditions.

The area considered for designation was determined to meet the criteria of an area which depends upon an aquifer for its sole or principal drinking water source and which, if contaminated, would pose a serious threat to the health of the Ridgewood Area residents.

#### VII. Economic and Regulatory Impact

Pursuant to the provisions of the Regulatory Flexibility Act (RFA), 5 U.S.C. 605(b), I hereby certify that the attached rule will not have a significant impact on a substantial number of small entities. For purposes of this Certification the "small entity" shall have the same meaning as given in Section 601 of the RFA. This action is only applicable to the Ridgewood Area.

The only affected entities will be those Area-based businesses, organizations or governmental jurisdictions that request Federal financial assistance for projects which have the potential for contaminating the aquifer so as to create a significant hazard to public health. EPA does not expect to be reviewing small isolated commitments of financial assistance on an individual basis, unless a cumulative impact on the aquifer is anticipated; accordingly, the number of affected small entities will be minimal.

For those small entities which are subject to review, the impact to today's action will not be significant. Most projects subject to this review will be preceded by a ground water impact assessment required pursuant to other Federal laws, such as the National Environmental Policy Act, as amended (NEPA), 42 U.S.C. 4321, et seq. Integration of those related review procedures with sole source aquifer review will allow EPA and other Federal agencies to avoid delay or duplication of effort in approving financial assistance, thus minimizing any adverse effect on those small entities which are affected. Finally, today's action does not prevent grants of Federal financial assistance which may be available to any affected small entity in order to pay for the redesign of the project to assure protection of the aquifer.

Under Executive Order 12291, EPA must judge whether a regulation is "major" and therefore subject to the requirement of a Regulatory Impact Analysis. This regulation is not major because it will not have an annual effect of \$100 million or more on the economy, will not cause any major increase in costs or prices, and will not have significant adverse effects on competition, employment, investment, productivity, innovation, or the ability of United States enterprises to compete in domestic or export markets. Today's action only affects the Brunswick Shale and Sandstone Aquifer of the Ridgewood Area. It provides an additional review of ground-water protection measures, incorporating State and local measures whenever possible, for only those projects which request Federal financial assistance.

Dated: January 12, 1983.

William D. Ruckelshaus,  
Administrator.

78 Fed. Reg. 1257 Filed 1-23-84; 6:45 am  
BILLING CODE 4300-00-00

#### SOURCES

1. MIDDLESEX COUNTY PLANNING BOARD, COMPREHENSIVE WATER PLAN PHASE ONE; APPENDIX: COMPREHENSIVE WATER PLAN PHASE ONE; COMPREHENSIVE WATER PLAN PHASES TWO AND THREE; RECOMMENDED WATER AND SEWER SYSTEMS: PLANS AND PROGRAMS, 1968, 1969, 1970, 1971 CONSECUTIVELY.
2. UNION COUNTY MASTER PLAN PROGRAM, SUMMARY - SEWER AND WATER PLAN, 1971.
3. PASSAIC COUNTY WATER STUDY, 1969.
4. MORRIS COUNTY MASTER PLAN WATER SUPPLY ELEMENT, 1971.
5. INFORMATION SUPPLIED BY ESSEX COUNTY DEPARTMENT OF PLANNING.
6. HUDSON COUNTY MASTER PLAN ON LAND USE - SEWAGE AND WATER, 1963.
7. BERGEN COUNTY COMPREHENSIVE PLAN WATER FACILITIES, FINAL REPORT, 1970.
8. INFORMATION SUPPLIED BY BUREAU OF POTABLE WATER.